

# The Journal of the United Service Institution of India

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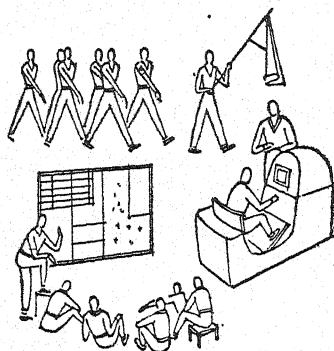
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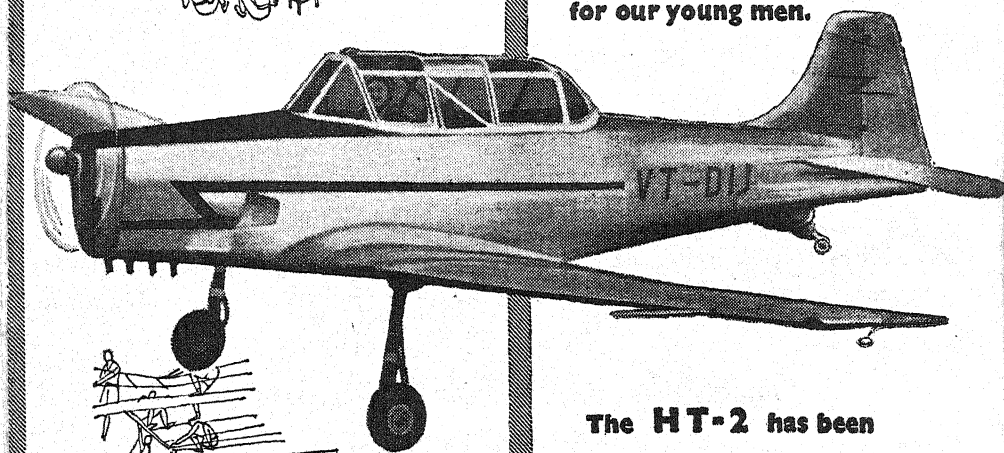
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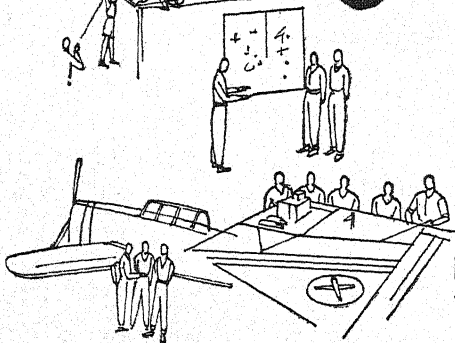
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# The Journal of the United Service Institution of India

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*The views expressed in this Journal are in no sense official, and the opinions of contributors in their published articles are not necessarily those of the Council of the Institution*

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## EDITORIAL NOTES

### **The Armed Forces in Britain**

More than ever before has the prohibitive cost of defence expenditure, and the existence of numerous lacunae in their strategic plans because of lack of funds, been brought home to the British people this year. The debate in the House of Lords last December revealed the startling dilemma of Civil Defence—that the methods of the last war are now hopelessly out of date; and, at the same time, anything approaching modern methods is financially prohibitive.

It is not only in Civil Defence that such lacunae may be observed. The argument over the 'New Philosophy', the streamlining of the forces for nuclear war, can be considered to have been won by none but the Finance experts. Lacking the financial power to maintain both conventional and nuclear arms, the decision has been taken in favour of the latter. The die has been cast, and manpower is being sacrificed. This situation, as will be appreciated by those whose business it is to plan for the defence of the country, is fraught with danger. For, if a war on conventional lines does start, the lack of manpower in 'The New Look' forces will be a serious handicap.

Another matter in which visible lacunae are causing alarm is the production of new weapons. Here again, it is the



power of the purse which is notably lacking. It has been estimated that in another two years or so nearly all the heavy (and some light) weapons of the NATO forces will have become out of date. And yet no nation, with the possible exception of the United States, is in a position to afford replacements as fast as the old weapons become obsolete. Britain spends something like fifteen hundred million a year on defence; to add to this budget is an impossible task under present conditions.

\* \* \* \*

The War Office has announced that the 24th Independent Infantry Brigade is to be earmarked specifically for tasks in support of civil governments of oversea possessions and colonies. It has been felt for some time that in these days of specialist training for nuclear weapons, it is difficult to provide emergency reinforcements for such duties from Britain's Central Strategic Reserve—the 3rd and 4th Divisions. There was need for some sort of 'Commonwealth Reserve' for policing duties. Air transport has been assured by the Air Ministry, who have agreed to provide a flight of light aircraft for the brigade. This will ensure that these troops will always be in readiness for action, in any part of the Commonwealth where the need for armed intervention arises.

Another reason for instituting this measure is that unless a specially trained force is maintained as a sort of 'shock troops' for such policing duties, much valuable time is lost in retraining at the scene of action. It was found that on the average it took some 8 or 9 weeks for troops to be 'locally trained'. In the absence of the large 'garrison troops' of pre-war days, this time-lag is too long for the successful conduct of internal security operations.

\* \* \* \*

A recent Defence White Paper announces a revision in the pay and pension rates of the British armed forces. With effect from 1st April, the scales of pay and pension for both officers and other ranks have been considerably increased. This has been done for two major reasons. As far as the other ranks are concerned, it is an open attempt to induce more national servicemen to enlist as regulars. It has been found that the dictates of modern war require an Army recruited on a more permanent basis—a term of at least 5 years'

engagement. The rates of pay have therefore been revised specially to encourage regular soldiering of five years' colour service in preference to compulsory national service.

In the case of officers, there has been a straightforward increase in pay, but no increase in allowances. An educational allowance has, however, been permitted—for all ranks—which grants £ 75 per child if placed in a boarding school. This has been very well received, as the need for a grant of this nature to compensate for frequent transfers has long been felt.

### **German Re-armament**

The problem of German re-armament has not been a straightforward one. At one time it even appeared as though Dr. Adenauer might have to revise his policy regarding the re-building of Germany's armed forces. The socialist opposition threatened to swamp the proposal from the start. However, he has recently been able to obtain the necessary support, and it has now been voted that the new defence forces will start raising with immediate effect. However, the socialist opposition, always afraid of the recrudescence of the Nazi spirit, has not surrendered without extracting some sort of concessions from the Democrats. At their instance, it has been decided that the Armed forces will be known as the 'Bundeswehr' (or Federal Defence Force) and not 'Wehrmacht', and will be placed under a partially autonomous Minister of Defence. Complete command will not vest in any one person, professional or otherwise, other than the Chancellor—except of course in case of war.

Ninety thousand troops are to be raised by the end of this year. By 1961, the Bundeswehr will expand to a total strength of an army of 12 divisions, an air force consisting of 20 wings—both fighters and bombers, and a small navy, the exact strength of which has not yet been disclosed.

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## GOLD MEDAL PRIZE ESSAY 1955 NATIONAL PLANNING FOR DEFENCE

MAJOR V.P. NAIB

**"A major modern war affects all aspects of the nation's planning and economy. Not only are the Armed Forces involved, but also every department of the Government and the major sectors of private enterprise.**

**What steps should be taken in peace to develop this homogeneity so as to ensure co-ordination at the top and co-operation at all levels in War ?\***

### INTRODUCTION

Viewed in the context of our national policy of peace and co-operation, a major modern war would not be of our seeking. If the present cold war between the two power blocs catches fire and a world conflagration develops, we may be drawn into it in spite of ourselves and against our will. Even otherwise, the present international set up is such that, in the absence of an effective international rule of law governing the conduct of nations, a threat to our national security may involve us in a major war. In either case, it would be total war because it would be a war for our survival as a free nation. These are grim realities from which our national policy of "dynamic neutrality", even with its positive efforts towards promoting peace, may not enable us to escape due to circumstances beyond our control. In such an eventuality, military preparedness is our only chance of survival. Apart from this, in another sense, such preparedness will strengthen our position as a neutral power and add weight and force to our efforts towards promoting peace in the world. We will be able to shoulder our international responsibilities with greater assurance, if to our moral stature is added the strength of military preparedness.

The need for military preparedness is, therefore, inescapable in the welter of modern power politics and international insecurity. But military

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\*Subject for the Gold Medal Prize Essay Competition 1955. This essay was awarded the Medal (*Ed.*)

preparedness for a major modern war by any nation will mean the harnessing of the energies and resources of the entire nation. It will affect all aspects of the nation's planning and economy. It will require a unity of effort, which means team-work on a national scale in which not only the Armed Forces but every department of the Government and the major sectors of private enterprise will have to play their part. It will, therefore, require careful planning and vigorous execution over a considerable length of time. This is because, the results of planning, particularly for a modern war, are not immediate but only achieved after some time. Such planning, to be rational, must be related to the means, for it must not be beyond the powers of the nation to achieve. Unless we view military preparedness in the national perspective as it exists today and is likely to exist in the foreseeable future, any steps we may recommend would be unrealistic and impracticable. Consequently, before considering the steps we should take to achieve military preparedness for a major modern war, it is necessary to examine the factors affecting it and determine the scope of such preparedness within the limits of our fiscal and material resources.

## PART I

### FACTORS AFFECTING MILITARY PREPAREDNESS

#### **The Nature of Modern War**

A major modern war would be a total war involving all aspects of national life. When it comes it would be highly technical and its tempo would be fast and furious. This would be so even if the war is started with conventional weapons and is restricted to a particular region. Later on, tactical atomic weapons could be introduced against targets in the battle area without resorting to their use strategically, because of the threat of great destruction for both sides. This state of affairs would last as long as the war is limited to a region and the great powers are not actively participating as combatants. Once they come in and the regional war develops into a world war, the employment of thermonuclear weapons of mass destruction against our war potential and civilian morale becomes quite probable. To speak of atom bombs and guided missiles, when we do not even have the capacity to provide conventional weapons, may sound unrealistic. But our inability to produce them should not prevent us from making a start to meet such a threat as far as our resources allow.

For the purposes of planning, an atomic war has to be considered.

passive and the active. The passive aspect relates to the measures we should adopt for minimising the effects of atomic missiles against both military and civilian targets. It also relates to the steps we should take to make our army retain its cohesion and function effectively under atomic fire. The active aspect is concerned with our defensive measures to prevent the enemy from launching atomic missiles, particularly against civilian targets, and our own force of atomic retaliation. It is obvious that we cannot afford to have a force of atomic retaliation for some time unless we have allies who are prepared to give us the equipment and the weapons. But we can certainly undertake the passive and preventive measures as part of our planning for military preparedness.

### **The Time Factor**

Both in regard to the preparation for a modern war and the actual conduct of it, the time factor is vital. It has been possible in the past for nations to build up their war potential after war was declared. This is no longer possible. A small holding force and our reliance upon the massive mountain barriers in the north and the seas in the south, cannot give us the time for organising our defences. "In an age of supersonic speed and guided missiles, as space shrinks so does the range of striking power increase, so that military time—that is time to operate in—is steadily being whittled down from months to days, days to hours, and hours to minutes" (A). The time factor, therefore, rules out any reliance purely on the defence. "To be on the defensive and wait for the enemy to attack is to invite disaster." Therefore, strategic plans for future warfare should contemplate the organisation of a "Striking Force", which is capable of taking the offensive right from the start and carrying the war into enemy territory.(B)

In addition to the organisation of the Striking Force, the plans should cater for keeping the necessary equipment and supplies on hand and get the defence production machinery well started at the outbreak of war. The latter is particularly important because defence production takes time to gather momentum even if we have the equipment ready.

### **Economic and Industrial Resources**

The state of our economy at present is such that our annual defence expenditure is being met with considerable difficulty. Although our defence budget allocation is barely sufficient to maintain our Armed Forces in fighting trim, its disproportionate weight on our meagre economy is often a subject of adverse comment in the Parliament and the Press. That

this criticism has not yet affected the defence budget substantially is largely due to the realisation by our leaders of the vital importance of national security in these difficult times. Even after practising the strictest economy it is not possible to divert any substantial sum from the defence allocation for any long-term defence planning. The only hope of embarking on military preparedness is for the Government and the public to appreciate its urgency and importance, and give it a place in the pattern of priorities that is being considered by the Planning Commission for the Second Five Year Plan.

As we are not yet self-sufficient in regard to important and expensive items of our defence requirements, a sizable portion of our defence budget is perforce spent on purchases in foreign countries. Apart from becoming dependent upon foreign countries for our vital supplies, we are also compelled to accept what they offer at the prices they choose to quote. In spite of its uneconomical price, the equipment so purchased may not meet all our requirements. This state of affairs will continue until we are able to meet all our defence requirements indigenously. But self-sufficiency in weapons and equipment for the Armed Forces is dependent upon the development of our heavy industries and machine tools, and the stockpiling of strategic materials. This again is linked up with the overall national planning.

It is therefore clear that under the existing state of our economy and industry, any plan for military preparedness must, of necessity, be a part of the bigger national plan for the development of the country as a whole. In trying to fit into the national plan, the military aspect is bound to encounter considerable difficulties. The very process of democratic planning, with its conflicting bids for priorities by sectional interests, may result in defence requirements getting a low priority. In the First Five Year Plan, defence requirements were not even considered, because the nation has been busy grappling with basic economic problems like achieving self-sufficiency in food, raising the standard of living of the people and providing employment for idle labour. Apart from the question of priorities, we cannot at present concentrate on achieving military preparedness at the expense of economic health and strength. At the same time we cannot afford to neglect military preparedness. One without the other would be unavailing. The problem is, therefore, to reconcile the apparently conflicting requirements of economic planning and military planning. This could be solved by giving greater emphasis to those aspects of economic

planning which have a bearing on military requirements. At the same time the military projects should be so planned as to contribute to the nation-building projects in as many ways as possible.

### **The Democratic Way of Life**

A democratic polity demands that the consent of the people is obtained by the Government for every major undertaking. Even after the consent is obtained, the very process of planning and execution is subject to a welter of pressures and politics and red tape, that are inevitable in a government by the people. When considerable difficulty is being experienced in the execution of our national development plans which have tangible benefits as their goals, the difficulties we are likely to encounter when we offer to the country a plan for such an intangible benefit as military security can easily be imagined. Unlike totalitarian states, we cannot throw ruthless discipline and iron control into our plan to mobilise our vast human and material resources, particularly during peace. In order, therefore, to prepare for a total war, every member of the community should understand and appreciate the goal and implications of military planning. This requires educating the public in regard to those matters and the development of a strong national character to face a total war. Above all it calls for leadership, not merely leadership at the top but at all levels.

### **The Scope of Military Preparedness**

The scope and general pattern of our preparations for a major modern war as revealed in the foregoing discussion can be briefly stated as follows :—

- (a) The steps we should take to prepare for a major modern war require careful planning on a national scale. The execution of the plan will necessarily have to be in stages spread over a length of time, with its progress increasing with the progress in the economic and industrial prosperity of the nation.
- (b) Under the existing state of our economy and industry, those steps cannot be undertaken at the expense of our economic health and strength. The military plan must, therefore, be integrated with the bigger national plan for the development of the country as a whole. If adequate funds cannot be made available specifically for long-term military projects, greater emphasis should be given to those aspects of economic and development planning which have a bearing on military re-

quirements. At the same time military projects should be so planned as to contribute to the nation-building projects in as many ways as possible.

- (c) In view of the effects of the time factor, the long-term projects of the plan must be tempered by adequate provision to meet an emergency at short notice. This is best achieved by the organisation of a "Striking Force" and its logistic support by keeping in readiness the requisite defence production machinery.
- (d) All the measures taken for equipping the Armed Forces and other related organisations should be so planned that self-sufficiency in defence production is achieved progressively.
- (e) In order to meet the threat of atomic warfare, we should start without any delay organising the passive and active defensive measures against an atomic attack. In regard to the organisation of a force of atomic retaliation it can only be a subject of long-term planning for the present.
- (f) Because of the inherent difficulties involved in democratic planning, the public will have to be educated in regard to the importance and the implications of military preparedness for a major modern war.

## PART II

Having thus determined in broad outline the scope of our preparedness to meet the threat of a major war, it is now possible to consider in detail the steps to be taken during peace to achieve it. In order to develop homogeneity of effort between the Armed Forces, the various departments of the Government, and the major sectors of private enterprise, as the terms of reference of this essay indicate, we require co-ordination at the top and co-operation at all levels. This is achieved by :—

- (a) Planning at the highest level.
- (b) Centralised Direction.
- (c) Effecting changes in the existing set-up to ensure co-ordination in regard to the major aspects of military preparedness like :
  - (i) industrial mobilisation;



- (ii) manpower mobilisation;
- (iii) the civil defence organisation and,
- (iv) transport and communications.

### PLANNING

#### **Integration of Development Planning and Military Planning**

We have neither the time nor the money to acquire facilities for mobilisation of our manpower and material resources each time a war or threat of war looms before us. Because of the changing pattern of war and its implements, the pattern of our military preparedness will have to keep on changing to keep abreast of new techniques. We must, therefore, have an adequate and flexible mobilisation plan for an indefinite period.

In regard to planning we are fortunate in having an organisation like the Planning Commission, which has gained invaluable experience in launching the First Five Year Plan successfully and is already busy working out the details of the Second Five Year Plan. Many of its divisions like the Resources and Economic Survey, Finance, Industry and Trade, and Communications, which directly or indirectly affect our defence programme, have been working on the economic development programme for some time. All that is necessary is to include defence requirements in the terms of reference of the Planning Commission.

#### **Constitution of Defence Planning Division**

In order, however, to determine the defence requirements, the Planning Commission should constitute another division, which may be called the Defence Planning Division. The functions of this Division would be :

- (a) To make an appreciation on the lines indicated under Part I of this paper for determining the scope and pattern of military preparedness. This would necessarily be approved by the Defence Committee of the Cabinet.
- (b) To work in close liaison with other relevant divisions and advise them on the military aspect of their sphere of planning.
- (c) To maintain continuous contact with the user Services and the various establishments concerned with development and production of defence requirements and work out methods to channel their efforts in the direction of self-sufficiency.

- (d) To advise the Procurement and Supply Organisation both inside and outside the country on the procurement policy, which again should be based on achieving self-sufficiency in respect of those very items procured outside the country. For example, if we are purchasing tanks for the Army's immediate needs, then the contract with the foreign nation or firm should provide for the eventual production of such tanks indigenously. This would to a certain extent mitigate the uneconomical price we would be compelled to pay initially.

In view of its varied and heavy responsibilities, the Defence Planning Division should be a high-powered organisation consisting of several sub-divisions dealing with different aspects of defence planning. A suggested organisation is given at Appendix "A". In regard to planning, these sub-divisions perform two important functions:

- (a) Advise the Defence Planning Committee in regard to their particular aspect of the defence programme.
- (b) Liaise with the other divisions of the Planning Commission and work out the details for implementing the decisions of the Planning Commission in regard to defence projects.

It will be noticed that the suggested organisation represents an integration of the civilian and Service elements and is high-powered enough for its recommendations to carry weight. There is also a certain Service bias in its personnel because, at present, unlike the United Kingdom and the United States of America, we do not have defence departments staffed with experienced civilians dealing with specific problems of mobilisation.

#### ORGANISATION FOR DIRECTION AND CO-ORDINATION

The responsibility for the direction and co-ordination of the defence mobilisation plan rests primarily with the Ministry of Defence and its various branches and the Services. The existing organisation is inadequate for dealing with the problems of defence planning as visualised above. For example, there are at present no specific departments to deal with subjects like manpower mobilisation and civil defence. Similarly, the existing set-up in respect of defence production, development, and procurement is neither adequate nor satisfactory. As separate agencies are responsible for each of them, they are subjected to different pulls peculiar

to each of them. In the absence of centralised control and direction, there is no close co-ordination of their activities, which is imperative both from the point of view of economy and for achieving self-sufficiency. This subject has been discussed very ably by Brig. B.D. Kapur in his article on "Controller General of Development and Production", which appeared in the January 1955 issue of the USI Journal. His suggestion for administrative centralisation of these agencies under one authority is the answer to the problem.

In order to achieve centralised control and direction and at the same time ensure co-ordination between principal agencies, the following changes are recommended :

- (a) Reconstitution of the existing agencies for defence production, development, and procurement under one Directorate responsible for all the three. A suggested outline organisation is given at Appendix "B". The functions of the various branches are self-explanatory. It will be noticed that the Development Department undertakes inspection of stores and equipment as at present.
- (b) Establishment of separate directorates for man-power mobilisation and civil defence. As the organisation of these directorates will be *mutatis mutandis* similar to those of the Territorial Army or the National Cadet Corps, they do not need further elaboration.

As there is a dearth of experienced and qualified officers at present, it is suggested that, as an interim measure, the sub-divisions under the Defence Planning Division should draw their senior cadre of officers from the directorates above mentioned. This arrangement will achieve speedier results and ensure that the machinery for planning and execution are on the same net during the difficult initial stages of the defence programme. Later on, when these officers are withdrawn to their parent directorates, the same close liaison should continue to be maintained between the two spheres of activity by other means.

Having considered the organisation for the direction and co-ordination of defence planning it is necessary to indicate briefly the steps to be taken in the important sectors of the plan.

## MOBILISATION OF INDUSTRY

**Long-term Needs**

As the sinews of war are provided by a nation's industrial system, the latter's importance for war is overriding all others. "An army today is but the cutting edge of a militarised industrial system" (C). The basic requirements of a nation's industrial system are its capacity to produce steel and machine tools. We are not self-sufficient in our defence requirements, today, mainly because our industrial system at present lacks these two basic requirements. But the acquisition of these requirements is subject to long-term planning. The country's need for them is, however, recognised by everybody and we have already made a good start for meeting these requirements in the First Five-Year Plan. The main emphasis is likely to be on heavy industries in the Second Five-Year Plan. Under these circumstances, the time appears to be opportune for orienting the country's industrial programme to meet our defence requirements. This is where the proposed Defence Planning Division comes in for planning the defence production programme.

The Planning Commission, advised by the Defence Planning Division, should determine several important matters in this respect. It should particularly determine the following:—

- (a) The development of the maximum balanced military power within the limits of our fiscal and industrial resources.
- (b) The industrial capacity of the country to support the military programme.
- (c) The peace-time foreign procurement policy to achieve progressive-self-sufficiency in our defence requirements.
- (d) The probable war-time requirements of the Armed Forces for an emergency, suggesting ways and means of obtaining them.
- (e) Plans for rapid conversion of industry to switch over from manufacture of civilian needs to military needs. This could be achieved by the erection of dual purpose plants, both in the public sector and the private sector. "These plants, while giving the nation the security that would result from the ability to convert quickly from peace to war production, will

at the same time put the emphasis on peace, not war. They will avoid the expense and waste of building and maintaining large plants planned only for war production" (D). A good example would be the establishment of an agricultural tractor manufacturing plant, itself anchored to one of our major automobile manufacturing industries, to be made capable of manufacturing tanks for war.

- (f) The improvement and development of weapons are a vital part of this programme. Therefore, the Development Branch of the Directorate of Production, Development, and Procurement in consultation with the Research and Development Sub-division of the Planning Commission should work on "long-term pilot models". At the same time "periodic education orders for the manufacture of key items" should be placed with the industries concerned to develop more effective equipment and weapons (E).

### Short-term Needs

As far as our long-term needs are concerned there is no cause for worry as the military programme will gather momentum with the progress of our industrial programme, which has already made a good start. The most difficult aspect of our defence programme is the short-term needs to meet an emergency. In this connection, the recommendations of the Blandy Committee, which examined the problem of industrial mobilisation for war in America, could be studied with advantage (E). Although these recommendations are based on the fact that America is industrially the most advanced country in the world, some of them, suitably amended to suit Indian conditions, are given below:

- (a) A machine tools reserve is a vital necessity to the defence programme. Immediate steps should be taken to provide this reserve both by foreign procurement and indigenous production. Although a machine tools reserve is critical to the nation as a whole, the military needs to meet an emergency must receive priority.
- (b) All Government owned plant and production line equipment necessary for defence production should form the nucleus of a National Machine Tools Reserve. Other private owned

equipment having a bearing on defence production should be placed in 'stand-by' under Government supervision.

- (c) Stock-piling of strategic materials, both raw materials and finished or semi-finished products, should be undertaken without delay.
- (d) To avoid the danger of the machine tools reserve becoming antiquated, close liaison must be maintained between the industries concerned and the related technical development establishments for effecting modifications or replacements to bring them up to date.

The success of both the long-term and short-term plans depends upon the ability of the Government to speed up the process of industrial mobilisation. This is comparatively easy in India, because, according to the Government's industrial policy, the manufacture of arms and ammunition, the production and control of atomic energy, and the management of railway transport, are the exclusive monopoly of the Government. In addition to this, the pattern of industrial development is such that the Government will own or exercise increasing control over all the basic and vital industries (F). The success of the industrial mobilisation programme is also dependent upon the measures to be taken to survive an atomic attack. This will require,

- (a) all practical action to reduce the vulnerability of industry to atomic attack; and,
- (b) plans for quick rehabilitation of strategic plants damaged by atomic attack.

#### MOBILISATION OF MAN-POWER

##### Scope of Mobilisation

Mobilisation of our richest resource, man-power, for war is of paramount importance. In a total war, this is the surest bulwark of our liberty and security. This has two aspects, the mobilisation needs of the regular Armed Forces and the needs of the country's second line of defence. The latter includes the requirements of the Territorial Army, militia type of forces like the Border Scouts, and civil defence.

### **The Regular Armed Forces**

It is not one of the purposes of this essay to enter into the familiar controversy between the exponents of mass armies of the militia type and the supporters of small regular armies. The best solution appears to be a compromise between the two extremes by having an efficient regular army, which alone can provide the "Striking Force" necessary for modern war, and at the same time organising as big a militia force as our resources permit to back our regular army. The needs of the regular Army must necessarily have priority over those of the militia force.

The provision of man-power for the regular Armed Forces does not present any big problem on account of their size in the context of our vast human resources. Here the question is one of quality rather than quantity. Provided the conditions of service are improved and made reasonably attractive, and the military profession is once again regarded with the traditional respect and recognition due to it by the public, the Armed Forces will be able to draw the best the nation produces in character, in intellect, and in culture. The existing organisation for recruitment and others like the National Cadet Corps, with a stricter enforcement of the present standards, should be adequate for this purpose.

### **The Second Line of Defence**

On careful examination, this aspect is vaster and presents more difficult problems than the regular forces. In spite of our best efforts, there does not appear to be enough popular enthusiasm for the Territorial Army. As a second line of defence, its present quality and strength are hardly sufficient to give us any feeling of confidence. In order to make it more popular a different and more vigorous approach is necessary. At present the locations of the Territorial Army Units are too far from the villages, and their activities and conditions of service are too much divorced from village life, to rouse the enthusiasm of the rural population. Besides this, very little effort is being made to enlist the help of local leadership. The only way of popularising the Territorial Army is to carry its activities to the villages, as it is only in terms of local programmes that local leadership and enthusiasm can play their part. As such a programme undertaken purely for military training would be very expensive both in terms of money and trained personnel, the military programme should be integrated with the national plans for social development.

The Community Development Projects offer tremendous scope for

work in this direction. They provide all the advantages which the Territorial Army lacks today. At present there are far too many organisations like the National Volunteer Corps, Bharat Sevak Samaj, Youth Leagues, Students' Labour Camps and others, whose activities are not co-ordinated, and yet they cost a considerable sum of money and effort. The answer is to concentrate on the activities of the most important and far reaching organisation, like the Bharat Sevak Samaj, and include military training amongst its other social activities. The Territorial Army should be disbanded and the money spent on it at present together with its personnel and equipment should be distributed amongst the units of the Bharat Sevak Samaj working in as many of the Community Development Projects as possible. According to the First Five Year Plan each Project covers a population of 200,000. The whole scheme, started in 1952, covers a total population of 15,000,000 and is planned to be progressively extended to the whole country. The details of organisation and military training should be worked out and this should cover both the rural and the urban population. Such an organisation is best suited for rousing popular enthusiasm and for educating the people in the spirit of patriotism for the country and the importance of the military programme for its defence. The military training should lay more stress on infantry tactics, weapon training, entrenching, radio-telephony, motor-cycling, truck-driving and maintenance, and para-jumping.

It will be noticed that under the above scheme, the military training would be continuous and spread over the whole period of the project instead of being concentrated for one or two months every year. As this would mean enforced idleness for the military personnel, as it is happening even now in the Territorial Army, it would be necessary in the interests of economy to,

- (a) train the officers and workers of the Development Projects in the military aspect of the programme;
- (b) progressively reduce the military officers and other ranks to the barest minimum and train them in the social aspect of the Development Projects.

The Community Development Projects would thus open up great opportunities to the Armed Forces in making their direct contribution to the nation-building activities, if military training could be integrated with social development as described above.



### Civil Defence

The magnitude of the task of organising civil defence for a modern war has been very well brought out in a recent exercise held in the United States of America. During the exercise, all the precautions against a major atomic attack were taken in selected places, which were the most likely targets of attack. These precautions included early warning, mass evacuation of people from the threatened areas, alternative arrangements for carrying on civil administration, maintenance of the essential services and the like. Even the President of America moved into an atomic air raid shelter from where he could carry out his normal duties. This exercise brought out the enormous difficulties of ensuring even a minimum degree of security against atom bombs.

When we add to the above picture, the vastness of our country, the lack of planning about the strategic location of our industries, the lack of education and discipline amongst the vast majority of the people, our present inability to organise a vast net-work of early warning system and the absence of an adequate force for intercepting an atomic attack, the enormity of the problem of civil defence in India becomes disturbingly clear. This, however, is no cause for despair. Even a country like America cannot achieve complete immunity from atomic attack, in spite of her vast resources and the thoroughness of her preparations. The only way of tackling the problem is by making a start and putting in a determined effort by all concerned.

As already stated, the proposed planning, executive and co-ordinating agencies should take shape immediately. First, a survey of all the vulnerable areas in the country, which are the most likely targets of an atomic attack, should be undertaken. Secondly, plans should be drawn up giving the detailed organisation and equipment necessary. Thirdly, development and research should proceed concurrently in respect of both the passive and active aspects of atomic defence.

Co-operation by the civil administration, the public as well as private institutions, and the individual members of the population is indispensable for a work of this nature. This can be achieved by educating the public about the nature and implications of atomic attack, the danger of panic, and the need for calmness and discipline. Countrywide measures should be undertaken for this purpose through the radio, the civil defence organisations and others like the Bharat Sevak Samaj. The training of the

civil defence organisations would necessarily be undertaken separately by the Directorate of Civil Defence for each of the vulnerable areas, through its own agencies. The Armed Forces would be contributing substantially towards this training and, in the event of an actual attack, they would be co-operating with the civil defence organisation, in the latter's numerous tasks. Their training would mainly deal with the practical measures for minimising the effects of atomic missiles, such as working in contaminated areas for evacuation of casualties and the clearance of debris blocking the roads, and the conservancy, the establishment and working of decontamination centres, the maintenance of the essential services, and a host of other problems arising out of the dislocation of civil life.

### **Transport and Communications**

While our road and rail communications are the economic arteries of the nation during peace, they are of vital importance during war for the movement of troops and supplies. In this respect co-operation between the Armed Forces and the department concerned with transport and communications is essential.

As transport and communications are important subjects under national planning, the Defence Planning Division should advise on the military needs in regard to them. A little extra thought and expense will make those projects more useful militarily in the event of a war than they would otherwise be, if they were developed purely for economic needs. The military needs require construction of bridges of higher classifications of forty and above, improvement of national highways for all weather and two-way traffic, construction of more new roads and laterals in strategic sectors, extension of railways to those sectors, construction of new aerodromes and improvement of the existing airfields, and construction of air-raid shelters at important centres of communication and ports. Finally, making the important facilities at these centres of communication and ports proof against atomic air raids should be undertaken as in America. Although the last proposal would cost a great deal, its importance ranks with that of constructing rail and port facilities to withstand an earthquake, which has been undertaken at our new port at Kandla.

### **CONCLUSION**

Unity of effort by the nation as a whole is a pre-requisite both for the preparation for a major modern war and the actual conduct of it.

This unity of effort on account of the vastness and diversity of its components cannot be achieved overnight. It requires careful planning and vigorous execution over a length of time. Any planning for military preparedness, however, should not be undertaken at the expense of the nation's economic health and strength. It should, therefore, be within the limits of our existing and foreseeable fiscal and economic resources.

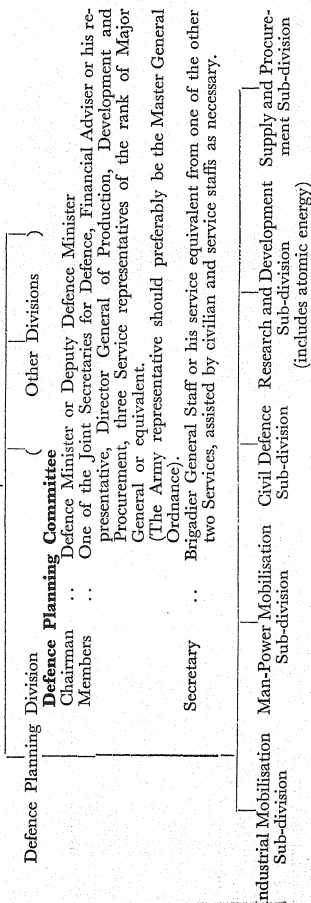
Under the existing state of our economy and in view of the priority accorded by the Government for social and economic development, the plan for military preparedness for a total war should be integrated with the overall plan for national development. For this purpose, the Planning Commission should be reconstituted to include amongst its other divisions a Defence Planning Division as suggested above. In order to ensure vigorous execution of the military programme and, at the same time, ensure co-ordination at the top and co-operation at all levels, steps should be taken to,

- (a) bring under one authority the agencies of defence production, development and procurement;
- (b) organise separate departments under the Defence Ministry for dealing with other major aspects of the military programme, such as mobilisation of man-power and civil defence.

Since the time factor is vital, steps should be taken, concurrently with the long-term programmes, to meet an emergency at short notice. As the preparations for civil defence and the programme for achieving military self-sufficiency proceed, a "Striking Force" should be organised without delay and it should be trained and equipped to fight an offensive war in this part of the world. The "second line of defence" should not be dependent on an inadequate Territorial Army which lacks popular appeal and enthusiasm. The second line of defence should be planned on a nation-wide scale and economically organised by integrating military training with the social development plans under the Community Development Projects. This will help to inspire true patriotism and generate a determination to resist the enemy, in every member of the community, as well as to provide the nation at large with military training and leadership at all levels.

## APPENDIX "A"

## PLANNING COMMISSION



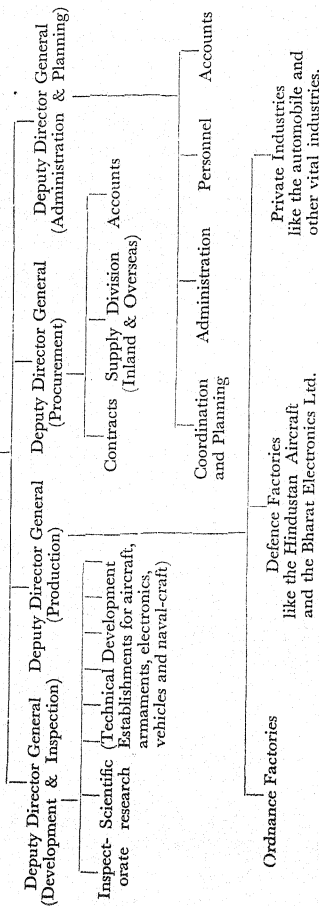
*Note—1.* The Director General of Production, Development and Procurement is a new appointment. The organisation and functions of this Directorate will be discussed subsequently.

*Note—2.* Each of the sub-divisions should be headed by a service officer of the rank of a Brigadier or its equivalent or by a Deputy Secretary from the Defence Department with adequate civilian and Service Staff as required.

*Note—3.* The number of sub-divisions are not exhaustive and could be increased as necessary, e.g., shipping.

## APPENDIX "B"

# **DIRECTOR GENERAL OF DEVELOPMENT PRODUCTION AND SUPPLY**



*Note.*—

The above organisation is substantially based on the organisation proposed by Brig. B.D. Kapur in his article on "Controller General of Development, Production and Supply."

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## SOME ASPECTS OF PERSONNEL ADMINISTRATION IN THE CENTRAL GOVERNMENT

S. B. BAPAT., I.C.S.

Lecture on Monday 19th December 1955

[With Air Commodore Arjan Singh, DFC, in the Chair]

THE CHAIRMAN: Mr. Bapat, who is no stranger to us, has very kindly agreed to give us a talk this afternoon on some of the problems of Personnel Administration in the Central Government. Mr. Bapat:

### LECTURE

My object in selecting this particular subject was to tell the members of the Defence Services, who I knew would compose most of this audience, something about the way in which the problems of "Personnel Administration" are being approached and dealt with on the civil side. Under the head of "Personnel Administration" a great variety of questions arise—most of them are so controversial that no categorical answer is possible. So I shall only touch on the general thinking and final conclusions reached in regard to these matters on our side.

At this stage, I might as well say that though it is quite easy to put the conclusions in the form of rules, that does not necessarily ensure the complete observance of the rules. The *reason* why such rules have been framed is not always appreciated or borne in mind. Take the example of kit inspections in the Defence Services. These are rigorously prescribed by rules and orders. And yet a bad officer may draw up a report of a weapon inspection without actually looking at a single weapon. Or even a conscientious one, though he really sees that the weapons are clean, yet may not know *why* they ought to be kept clean in that particular way.

On the civil side, a very large number of people are concerned with the enforcement of the Service rules. As a result the rules are frequently not observed at all, or even when the rules are observed, it is done

mechanically without keeping in view the underlying object. I propose while conveying what our ideas on the subject are, to say also where failures on a large scale take place.

There are, undoubtedly, some differences in the personnel administration of the Forces and on the civil side. The approach is different and some of the methods are also different, but even in the Armed Forces there is a large number of civilians whose duties are more or less similar to those on the civil side. If my talk provokes some comparison in "Personnel Administration" as it goes on in the Armed Forces and the civilian organisations connected with the forces my main object will be well served.

## II

For achieving the desired ends, whether in the field of Government or any other field, we need men, money and material. I will not talk about money or material. I shall talk only about men. We must have men in the right quality and numbers to do the job which has to be done. We must, therefore, start by analysing the whole thing in a systematic way: "*How many* men do we need?" and "*what* sort of men do we need?" and "*how* are we going to get them?" "How do we make sure that they will work and behave properly and yet stay contented?" etc. That is how the subject is approached and we reach the various aspects of "Personnel Administration," namely, "recruitment," "training," "placement", "conditions-of-service," "discipline" and "morale." In simple terms, you must first get your man, then you have to see that he is trained in such a way that he is fitted for the particular job. You have also to see how much he is going to be paid, how much leave and pension he will get and so forth. Then you have to keep him in order, and ensure control and discipline. At the same time you must also ensure that he is happy and contented. That is the systematic line along which we have been thinking on the civil side. So I will talk about it in the same order.

## III

When we talk of recruitment we have to see *what* we are recruiting to. Therefore, as the first step in recruitment we have to have in our mind a frame-work of organisation. Generally, there are many different types of jobs to be done, of varying importance. That brings with it a



classification and grouping of officers. This classification may be according to functions or territories or both. On the civil side we have a horizontal classification by the importance of the work. We have Class I, Class II, Class III and Class IV *services* in parallel layers, one above the other.

We also have classification according to the kind of work done. Take the administration of the Income-tax laws—assessment, collection, etc. This is a big activity. So we have an Income-tax Service which has officers of Class I, Class II, Class III and so forth. Other activities like Customs, Excise, Accounts, etc. on the civil side, all have their separate groups of officers. This system of having distinct services for distinct purposes by a vertical classification is not necessarily found in all countries. We are used to dealing with separate services and the advantages, especially in a very large country like India, are obvious. Take another department, say, Posts & Telegraphs which comprises higher officers of Class I and Class II, clerical staff Class III, and then some Class IV, messengers and peons. Because the territory of India is very large, it is necessary to organise these regionally. When we want postal clerks or railway clerks, it is just not possible to recruit and administer them on an all-India basis. You have to recruit them from more or less within the local region.

I said that for a large country like India there are obvious advantages in having separate services for activities and functions of a specialised nature. But there are disadvantages too. One great disadvantage is that you get too much of what you may call "caste system feeling." Not only are there feelings of caste system as between different services, there is also such feeling among members of the same service but belonging to different classes. But nevertheless, Government's activities about Income-tax and other like functions are so self-contained and there are so many technical aspects involved that it is on the whole advantageous to get men who are specialised in that line, though the danger is always there that people get narrow-minded. We had, therefore, to revise our thinking generally. This re-thinking began as far back as 1938 and we have now come to the conclusion that though because of the reasons of space and differences and technicalities of particular types of administration, it is necessary to have distinct services, there should be a freer flow of officers from one activity to another *at the higher levels*. So that specialised knowledge is complemented by the growth of generalised knowledge and experi-

ence. Let me take an example from the Armed Forces. There, not only at the higher level but even in lower level commands, promotions go not by specialisation in a particular job but on the basis of general administrative ability and qualities of leadership. So while there should be special or separate services for activities of a specialised nature or of big scale, there should also be a *general administrator* type developed for higher jobs.

#### IV

Our Constitution lays down that there should be "equality of opportunity" in the matter of public employment. Recruitment to the All-India Services like the I.A.S. & I.P.S., is, therefore, made on the basis of all-India competitive examinations held by the U.P.S.C. The same is more or less true of the State Administrative Services, i.e., they are recruited by competitive examinations held by the State Public Service Commissions. We have to organise examinations on a large scale. The recruitment by the Central and the State Governments through their respective Public Service Commissions includes an interview test. There is some misunderstanding in the general public about the interview tests. But some kind of interview test must be held if only because higher administration now-a-days requires the administrators to "state the case" orally and argue across the table to a great extent. The personnel recruited should be of the calibre who must be able to function effectively in committees and inter-departmental meetings. He has to give a good account of himself by stating his case clearly, cogently and effectively. He should be a good listener, a good talker, a good mixer, quick in appreciating and meeting the views and questions put to him by others. This kind of quality cannot be tested by written examination only. Notwithstanding its limitations, the interview is a reasonably reliable test. As the members of the Interview Board are persons drawn from the various walks of life, possessing diversified experience of men and affairs, the danger of biased and subjective judgment is very largely neutralized. Some years ago, I asked the Minister of State for Home Affairs, Shri Sidhwa, who was one of the strongest critics of this test, to come and sit with us at the interviews which were then going on. He did so and became completely convinced that the interview test was absolutely necessary. Later on, Shri Sidhwa retired and Shri B.N. Datar came in as Deputy Minister in the Home Ministry. I took an opportunity of taking him also to the Interview Board. He, too, was convinced of the

great usefulness of the test. I also took the Home Minister Dr. Katju to the Interview Board and he sat with us and came away satisfied.

Where recruitment is not made through the Public Service Commissions but directly by the Government department concerned, there is sometimes a failure to observe the spirit of the rules. The objective after all is to ensure that the tax-payer's money is utilised in the best way possible and, therefore, no man should be employed unless he is considered fit for the particular job to be done. Sometimes a job is created or modified to fit the man rather than finding the man to fit the job. This is, however, a rare exception. To help the Departments *inter alia* to comply fully with the requirements of the existing rules and regulations on the question of recruitment, the Organisation & Methods Division, Cabinet Secretariat, have prepared and circulated a "Guide for Establishment Officers." The Guide gives in detail the various steps which have to be followed in recruitment. First, we have to "create" a post for a particular job, and then we have to lay down certain standards of qualifications required for it and the methods of recruitment to be adopted. The best person for the job would be one who possesses the required qualifications and is physically fit. But in actual practice sometimes you have to ignore all this temporarily and find out a job for a particular man. If this is done, it should be done with open eyes as an "exception" not to be lightly repeated.

## V

Next comes the question of training. Our thinking on the subject has been fairly constant. We distinguish between basic training and specialised training for particular jobs. For the higher administrative services, we have the I.A.S. Training School. The Indian Audit and Accounts Service has started their own school. The Railway Services have their own training institutions. The Income-tax Department operates a separate training programme. For higher clerical grades we already have a Central Secretariat Training School. But there is a feeling that all the officers which Government recruit for senior services whether for the Income-tax or Audit & Accounts Department, should get a *common basic training* for at least six months or so, before they are sent to serve in the *particular* service concerned. The general part of the training would cover knowledge of India's social and economic problems, a knowledge of the main constitutional provisions and the machinery of Government, a knowledge of the principles of organisation and administration and

grounding in human relations as applied to administration. There is a feeling that such basic training may be organised on an all-service basis and the problem is receiving our active consideration. One of the main difficulties would be to provide accommodation and a training staff adequate for the large number to be handled. To bring trainees together we would need large hostel accommodation and considerable finance. Notwithstanding all these difficulties such a common training for all higher services would certainly be advisable.

However, the main emphasis on the civil side is on training "on the job," i.e., training which every man is entitled to get from the man next above him. In the old days there was very little organised training for the I.C.S. officers *before* they started working in the field. New recruits had to spend a year or sometimes two years, of probation in England. There was no formal basic training in Administration. The probationers were taught Indian History, Indian Criminal Law and the language of the Province in which they were to serve. Thereafter, they were placed and trained on the job under the direction of District Officers. The District Officer in charge took special care to explain, and acquaint the trainees with every item of work he handled—case work, interviews, conferences, public meetings, etc. It was the duty of each officer to train the man next below. One of the items to which his superiors attached great importance was how he was training the men under him. In the Secretariat too, it was the duty of the Section Officer to train the Assistants working under him and, in turn, it was the duty of the Under Secretary to train the Section Officers. To train and supervise a subordinate needs a positive effort. As the war came, new recruits were needed in large numbers to cope with the increase in work in the Secretariat departments and in the field. It was impossible to train them adequately. The introduction of the untrained element in the services, in turn, resulted in loss of the former emphasis on training the subordinates in their jobs. A vicious circle was thus set up, the after-effects of which persist even now despite recent attempts to strengthen in-service training. The feeling of not getting proper training still persists in the lower ranks, though in the higher services there has been a considerable improvement.

## VI

The next important problem in personnel management in the Central Government relates to placement, *i.e.*, postings, promotions and trans-

fers. In the old days the posting authority used to be more or less in the hands of one man. The same was true about promotions. Even now in England the authority for promotions is vested with the Head of the Department. The Secretary of the Ministry is, however, guided by the advice of an advisory committee. This is because group judgment is always better and more objective than individual judgment. In India, we have a Central Establishment Board consisting of five or six Secretaries to Government. It deals with postings and promotions of officers of the All-India and Central Services to hold higher Central posts. Whenever there are vacancies, the Board surveys the whole field and considers all possible choices for a particular post. For the foreign service there is similarly, a Foreign Service Board. For purely departmental promotions we have Department Promotion Committees consisting of senior officers in the Department. A member of the Union Public Service Commission is always associated with them. As in the higher levels of the Armed Forces, our experience is that group judgment is definitely advantageous as it provides for exchange of information and views and reduces the risk of judgments being based on conscious or unconscious bias.

Unfortunately, on the civil side there is widespread failure in the proper discharge of their duties by persons whose job it is to record confidential reports on the work of their subordinates. This makes it difficult to ensure that the right man is selected for the right job. It is admittedly an irksome and difficult task to sit down and write a considered objective estimate about somebody's performance and qualities but a conscientious officer faces that task despite the difficulty. Generally, however, too many officers do it only perfunctorily. There is, for instance, a marked tendency to grade a person as "satisfactory". What is "satisfactory"? Some people think that "satisfactory" is merely to avoid saying that the man is "no good". The form of confidential reports recently introduced in the Central Government, pose specific questions to which answers have to be given and also ask for a general rating in one of the five categories: "outstanding", "very good", "good", "fair" and "poor". In the last analysis, the usefulness of the confidential reports depends upon their objectivity and uniformity of rating standards. Otherwise, it is very difficult to use these reports as a basis for promotions and selection. I believe it is customary in the Indian Army to show the confidential reports or at least the adverse remarks to the officer concerned. I do not know whether this is also done in the Navy and

the Air Force. Theoretically, it is only fair that a man should know what his superior thinks of him and have a chance to improve when improvement is needed and is possible. However, the superior may in such cases, hesitate to say what he really thinks about the subordinate's work. An adverse entry in the subordinate's character roll may also permanently injure the relations between the reporting officer and the person reported on. The question is a very difficult one. We have, therefore, tried to adopt on the civil side a system under which all remediable defects are usually communicated to the person concerned. Indeed, communication of adverse reports is to be the rule and non-communication the exception—to be deliberately made by the reviewing authorities. A connected internal check which has recently been instituted is that as a rule all confidential reports by officers immediately superior, are submitted for review to the next higher authority. The principle is obviously not applicable at the highest level, *i.e.*, in the case of a Secretary to Government. The next higher authority is usually able to say whether the reporting officer has made a reasonable and balanced estimate. If there is excessive praise or blame, he can say so. It is also for the reviewing authority to decide whether the adverse remarks, if any, should be communicated. As a rule, all adverse entries are to be communicated to the person concerned, except when the reviewing officer considers that their communication will serve no useful purpose. All this is prescribed in the general instructions concerning writing of confidential reports. Another general instruction is that before recording an adverse remark about a subordinate, the reporting officer should ask himself: "Have I done my due share in giving proper training and guidance in regard to his defect? Has the man had a chance to improve?" It has been noticed that reports on the work of Assistants written by Section Officers are not always sufficiently objective. This is really unfair and unjust as these reports make a big difference in the Assistant's subsequent career. Where there is such a failure it is the bounden duty of the officers responsible for the administration to give serious thought to the matter and set it right. Nor does lack of objectivity operate in one direction only. I have found that reporting officers very often give good reports despite the fact that the person concerned does not deserve them. To praise undeservedly is no less harmful to the public interest than to blame without justification.

As a result of the implementation of the recommendations of the Central Pay Commission there is now much more uniformity in pay

scales of civil servants in the Government of India than there used to be. The large number of different pay scales that existed before have been replaced by a few standard scales, into which any new post created is now fitted. Although civil servants of all classes feel naturally that their emoluments compare unfavourably with the reward in the private sector, the question of remuneration has perhaps on the whole been solved satisfactorily.

One problem is created by the fact that though there has been changes in the conditions of service, many employees are still governed by the old conditions. There are, for instance, the "unrevised scales of pay" and the "revised scales of pay"; there are "old leave rules" and "new leave rules"; "old pension rules" and "new pension rules", etc. With the gradual transition towards a socialistic pattern of society there is a feeling that the New Rules should be made applicable to the old entrants also. But the older men came in under different conditions of service which have since shaped their lives. Basically, it is a sound principle to continue the terms of the contract of service agreed to at the time of entry. That preserves and heightens the *morale* of the services. New Rules should be for the people who are new recruits or the old employees who were under notice at the time of recruitment that their conditions were under review.

Much unhappiness and loss of *morale* is caused by delays in the settlement of claims of pay and allowances, etc. There is, in every Ministry, an Under Secretary or "Establishment Officer" dealing with such matters. But even in the case of senior officers a long time is taken before they get the pay fixed or the first pay drawn, though these should be simple operations. If a man has been promoted temporarily from one post to another, he cannot draw the pay unless the "pay slip" is received from the audit officer. The story is hardly different in regard to getting a letter of appointment, undergoing a medical examination or gazetting a confirmation. The lower the rank, the less the attention paid. A senior officer usually gets the things fixed up quickly as a special case. But when it comes to the Assistant or the Clerk, there are very long delays; people often do not get their pay for three to four months, though they have been and are doing their work. It is a failure that we have to be ashamed of and one of the projects we have at present in hand is to bring about an improvement in this state of affairs. To start with, something like a training class for Establishment Officers—the people who are dealing

with matters of appointment, pay and allowances—is essential, and I am hoping that one will be started soon. I hope that Organisation and Methods work will also help to improve matters. Of all personnel matters, it is in regard to pensions that the greatest difficulty and delays are experienced. A man retires; his source of income dries up suddenly though he has a family to support. But it is nobody's responsibility to see that his pension papers are prepared and progressed properly so that he receives his pension in time without being put to any hardship. Here we often have a complete lack of regard for the human aspect of administration. I hope things are not as bad in the Defence Services ! There is a moral obligation on the Establishment Officer to ensure prompt payment of salary.

I have taken much of your time. I shall be glad if there are any points on which you would like to have further information.

### DISCUSSION

QUESTION : We heard that the Government was going to create a new service to cope with the demand for trained personnel for state enterprises. Is anything being done ?

ANSWER : With the expansion of the Government activities in the development sphere, there is an acute shortage of trained personnel for manning technical and managerial posts in Government enterprises of an industrial character. In order to meet this acute shortage, state enterprises like the Airlines Corporations have started to recruit suitably qualified young officers direct from the open market and to impart them the necessary training. In the long run, even the public enterprises will be able to produce, from their own resources, all the trained managerial talent they need. But, for the present, it will be necessary to draw upon outside sources. There is a scheme under the consideration of the Government, which aims at the setting up of an "Industrial Management Pool". This would not be a regular cadre but just a pool of people under the control of the Government who have the necessary experience of industrial management and who can be deployed from time to time to those enterprises in which they can be most useful. The "Pool" will be managed by a committee on which representatives of the various "consuming Ministries" will serve. Recruitment to the "Pool" will be made from all the available sources—private industry, government service, and professions.



THE CHAIRMAN: We have just heard a very interesting talk. I think the speaker has covered the field on the Civil side very well. We must bear in mind that all of the problems mentioned apply to us also as they are human problems and apply to human beings. I would just like to say that we in the Defence Services also have a system where the Boards select officers for various promotions and postings some of which have to be put higher up of approval. Now I would like you to show our appreciation of the very interesting lecture which Mr. Bapat has given. (*Applause*).

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## ORGANISATION FOR WAR IN MODERN TIMES\*

FIELD-MARSHAL THE VISCOUNT MONTGOMERY OF ALAMEIN,  
K.G., G.C.B., D.S.O.

ON 21st October last year, 1954, I gave an address here entitled, "A Look through a Window at World War III". That address created quite a stir in military circles in this country and even more so in the U.S.A. It therefore fulfilled its object, which was to try and direct thought to the future. In this lecture I propose to discuss the subject of organisation for war in modern times. I have chosen this title because it is my view that our defence organisation today is *not* suited for modern times. Having made this seemingly destructive criticism, let us see if we can construct something sensible from the ashes; and ashes there will continue to be if we are not careful.

### THE STRATEGY OF MODERN WAR

The earth consists of large masses of land and great areas of water. Man is primarily a land animal and control of the land masses has always been for him a priority objective in war. Many centuries ago he found that a skilful use of the water areas of the world opened up the land masses to him, and enabled him to pursue his objectives the more easily.

Man then learnt to fly, and he soon found that unless he could dominate the skies above the land and the water, he could not carry out satisfactorily the land and sea tasks necessary for his purposes.

Against this background we reach the conclusion that in global war today and in the foreseeable future, air power is the dominant factor. Therefore the first object in our strategy in the Western Alliance must be to win command of the air.

Secondly, it will be essential in an East-West war that we should control the seas. That is, we must be able to use the seas ourselves and deny their use to the enemy.

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Next, while the air battle is raging and the struggle for control of the seas is in progress, it will be vital to prevent enemy land forces from occupying the territories of the Western peoples, disrupting our way of life, and using our industrial and production organisation for their own purposes. If these things were to happen we would lose: no matter what successes we gained in the air and at sea.

The armed forces necessary for this strategy must be organised in such a way that they are geared to a nuclear capability, with all that this entails in the use of firepower and in the saving of time and manpower.

These forces must be suitably organised for the conditions of peacetime activities, which may at any time include small or limited wars in which nuclear weapons are unlikely to be used, *and also* for the conditions of world war in which nuclear weapons would certainly be used by both sides.

The problem will then be to get a right balance between air, sea and land forces, and one that will suit the needs of the national problem and also enable the nation to play its full part in the Alliance. In addition, a sound Civil Defence organisation is vital in each national territory and this must be under military direction and control.

All these requirements must be provided within the financial limits laid down by Governments. The economics of defence are becoming a vital problem today.

Let us see if we can point the way towards solving some of the problems that will arise in producing the right organisation and the right forces, all within the realm of financial possibilities.

### THE CONDUCT OF WAR

We are in the midst of a revolution in military affairs, brought about by scientific advances in the development of nuclear weapons and the means of delivering them. As a result, the capability to destroy is reaching unprecedented proportions. Certain changes in warfare will follow, because of this revolution in weapons. I will name two which are very important and will have an impact on future defence organisation.

First will come a change in the tempo of war. Stockpiles of high yield weapons will create such destruction early in a war that the phase

of decisive operations will begin almost at once. It is clear, therefore, that the forces which are essential for the conduct of operations during the first phase must be "in being" in peace, and be immediately available on mobilisation. There will be no time in which to train these forces after the outbreak of war.

The second point is that, because of the increased tempo of war, we must be able to execute our plans with speed and efficiency at once. The side that can execute its plans the most effectively *from the very beginning*, will gain the advantage. We must also be able to sustain our operations in the face of continuing destruction of a magnitude previously unknown.

We must now examine the conduct of war in more detail and see if we can reach conclusions about the shape of things to come.

#### GLOBAL DIRECTION AND COMMAND IN WAR

My first point deals with the direction of the war, and the command of the fighting machine. I must remind you that there would be only one war and that it would be global. The strategy for this global war demands early command of the air. This brings us at once to the subject of air power.

#### AIR POWER

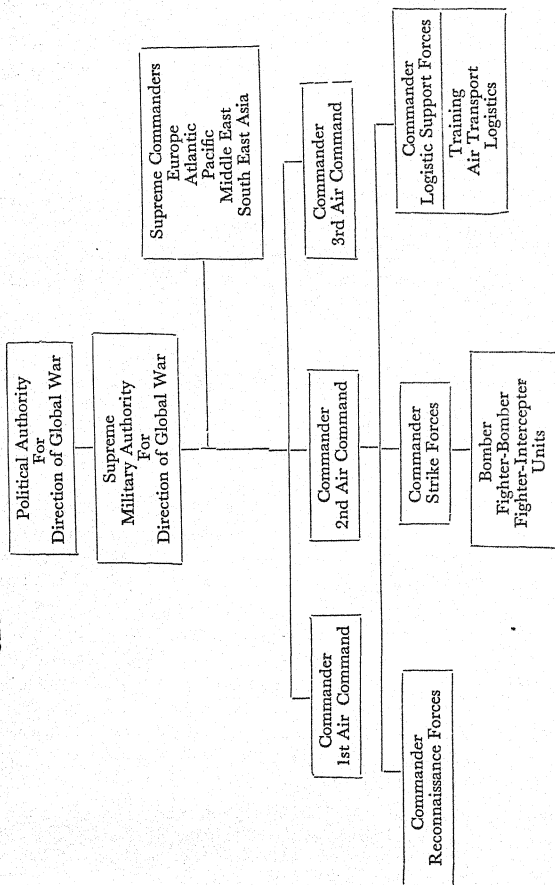
We can master the air only if we destroy the enemy air forces. We shall never be able to do this unless we organise and control the air forces of the Western Alliance as one single mighty weapon of air power.

The first task in global war is to win command of the air. Victory in this operation will go to the side that is superior in executing sustained operations in the face of unprecedented destruction. The blows that are launched against the enemy in the global air war must be timed and directed as part of a single great campaign. The Western Alliance must have the means of centrally controlling all moves in the global struggle for command of the air.

Here is the way I consider the Western Alliance should organise in war time, and this chart gives the organisation I propose.

We should establish a single political authority for the direction of war. I would put this authority in North America.

## GLOBAL COMMAND AND CONTROL IN WAR



I have put the military direction of the global war in the hands of a Supreme Military Authority. This authority would control world-wide air operations, either through some agency within their own organisation, or, better, through a commander appointed for the purpose, who should be an American, since the U. S. A. has the only large strategic air force in the Western Alliance.

The chart shows the lines on which I suggest the control of the air forces of the western world could be based. I will not discuss the control of surface forces as I think our experience has produced a system which is suitable for war, provided we get the right structure at the top. But the control of air forces is another matter. The war in the air is essentially one battle against a single enemy. If it is planned and conducted as a series of separate battles, we lose flexibility and the ability to concentrate.

On the right of the chart you see the Supreme Commanders. Today we have two. I consider there should be five, as shown on the chart. Each Supreme Commander may, or may not, have subordinate air commanders; this will depend on the situation.

For the initial air battle I consider it will be better to retain all the air forces under the direct control of the Supreme Military Authority.

The Supreme Military Authority allocates the Western air forces and resources to subordinate air commanders in relation to their tasks. It will of course consider the countries of origin of these air forces, and their logistics, when making the allocation.

Each commander has three forces with which to fight, *Reconnaissance* forces, *Strike* forces, and *Logistic Support* forces. By "Support" I mean training, air transport, logistics. It has nothing to do with the support of land or naval forces; that is one of the tasks of *Strike* forces, which are composed of bomber, fighter-bomber, and fighter-interceptor units. Another task of *Strike* forces is air defence.

With an air command system of the type I have shown on the chart, the whole weight of the air power of the western world could be applied quickly to the right targets.

When the Western Alliance had established a satisfactory degree of control in the air, I see Air Commanders being put under command of Supreme Commanders. There is no difficulty about this, the organisation is completely flexible. It is very important to understand that it is

comparatively easy to decentralise from a centralised organisation; the reverse is always difficult. In this set-up, the Supreme Military Authority can quickly re-group air forces to suit any situation.

We must, of course, examine such an organisation more closely. What I have said are my views on the way we should start thinking about organising the control of air power. There are many details to fill in. But if we can get the broad pattern right, the details will fall naturally into place.

#### TACTICAL AIR FORCES

Before leaving the subject of air power, I give it as my opinion that the development of guided missiles and short-range rockets will force us to recast completely our present organisation of tactical air forces. These are highly vulnerable so long as they are tied to long, easily distinguishable concrete runways in forward areas. By increasing the number of airfields in order to get greater dispersion, we are solving only part of the problem. We must also change the *nature* of the problems for an enemy, so that he will not be able in one surprise nuclear blow to eliminate a high proportion of our offensive capacity.

The solution lies in so dispersing our means of delivering blows against an enemy, that these could not be located easily and would not be a fruitful target for nuclear attack. We must, in fact, evolve equipment, weapons, and techniques whereby our aircraft, our vehicles of delivery, can be launched without the use of large airfields. We must develop zero-length launches and rocket-assisted take-offs, using PSP airstrips in fields through the countryside; possibly, a flight of six aircraft could operate from each airstrip. There will be problems of the operational control of such a widely dispersed tactical air force; there will be problems of maintenance and of recovery.

I consider that we must plan to disengage the tactical air forces from the role of air defence. That part of our tactical air forces which has the role of co-operation with the land forces must be free to do so; for this task they must carry nuclear weapons and their primary task will be to disrupt enemy land movement, beginning when it is at a distance from our own forces.

#### SEA POWER

Let us discuss sea power.

If the strength of our offensive air power fails to deter an aggressor, and war is forced upon us, then it will be vital to have control of the seas. This will be necessary not only for the transport of men and materials, but also to give increased flexibility to our operations generally.

I am on record as having said that, in an East-West war, the West could not win if it lost control of the Atlantic. One of the means to bring Western Europe to its knees, without the necessity of complete thermo-nuclear destruction, would be to cut off all supplies. One way to avoid this happening would be to develop an air transport organisation to supplement the life-line by sea; but this we have not got.

Today, navies are responsible for control of the seas and for maintaining sea communications. Adequate naval forces must be available to meet this threat. In the conditions of today, those naval forces must have their own air forces, since it is no longer possible to allocate either to ships alone, or to aircraft alone, tasks which call for the close co-operation of both these arms.

If what I say has validity, then it would seem that sea power is indivisible.

Sea power must fight over, on, and under the sea—and must be handled by sailors. We therefore arrive at the fact that the responsibility for sea communications is indivisible; today it belongs definitely to navies.

I am also on record as saying that air power is indivisible.

Is it therefore necessary to draw a firm dividing line between sea power and air power? The answer to this question will become clear as we proceed in this address.

#### LAND POWER

Efficient, well trained, and highly disciplined armies are a vital element in the defence forces of every nation; they are an essential part of the inter-Service team. I do not propose today to discuss the problems and tasks of land forces. I dealt with the subject in some detail in the address I gave here in October 1954. But I would like, in passing, to touch on two points.

*Reserve armies.* I consider that a detailed investigation is needed into the size, role, tasks and organisation of reserve armies in the European



theatre, e.g., the Territorial Army. The reserve armies that were organised during the period 1946-48 were needed for a certain definite role. The advent of nuclear weapons of all sizes, in quantity, has changed that role and today reserve armies are not in any way organised or geared for the changed conditions.

Having defined the role of a reserve army, an organisation is required which will ensure it can carry out that role in terms of efficiency and time. Today, none of them could do so.

*Organisation of divisions.* I consider that the day of the armoured division and of the infantry division *as we knew them in the late war* is past. The armoured division is expensive in overheads, it lacks staying power, and it is not capable of sustained battle action. The infantry division cannot fight effectively in most countries without armoured assistance, and tanks must now be an integral part of the division.

When fighting begins on land the best results are obtained initially by teams or groups composed of infantry, tank, and artillery. I consider it is therefore best to organise and train that way in peace. I would form 'Standard divisions', abolishing the infantry and armoured divisions *as we know them today*. The chart below gives you my conception of a 'Standard Division' for the European theatre.

This Division could fight effectively on a wide front in the mobile battle, organised in three fighting groups or teams. Alternatively, it is suitably organised to fight with cohesion in the static battle. In either case it has staying power, and that is essential.

There will come a moment in the tactical battle when the opportunity is favourable for launching a flood of tanks against the enemy. For this reason a Corps should have two independent armoured brigades, each of three armoured regiments and such other arms as are considered necessary. There might be a small H. Q. to command this mass of armour in the Corps.

#### LAND FORCES GENERALLY

The governing factor in land armies is that they must be reduced in size as atomic weapons become available. It is specially important to reduce the administrative "tail". We must also reduce the number and size of headquarters and not have a Divisional H. Q. when a Brigade H. Q. would do the job. And finally, the Divisional Artillery must have

THE STANDARD DIVISION

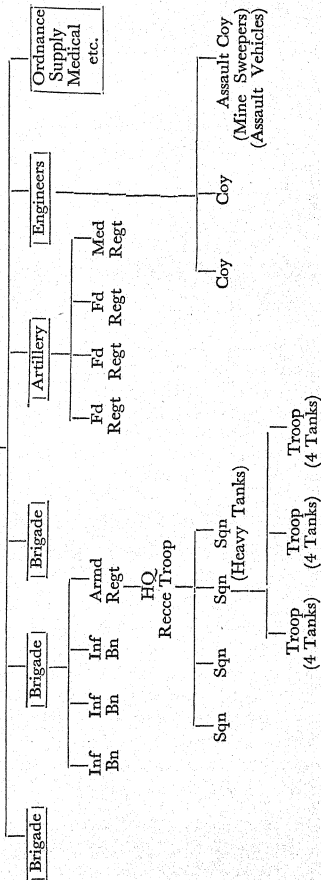
DIVISIONAL H.Q.

Sqn Amphibious Tks  
Flt of Helicopters

LOGISTICS

Army  
Division  
Unit

Each Bde HQ on a Tac Basis



range, and the infantry battalion must have mortars and also its own means of anti-tank defence over and above any tanks that may be allotted to work with the battalion.

### LOGISTICS

Let us now examine logistics; or administration as we call it in the British forces.

We shall be fighting the air war at 700 knots or more. But we still have a logistic system that moves at 15 knots.

I consider there is a requirement for air transport on a gigantic scale. We should start now to build a world-wide air transportation capability to meet our deficiency. If we are to sustain air operations in the great air battle, the weapons and the men and the supplies needed by the air forces must move at hundreds of knots, not fifteen. Air transport is the only way to do this. This opens a wide range of thought. For the Western air forces, air supply is essential. But would it not help to solve other problems ?

An expert once said : "Air transport is the *best* means to get supplies to most places, it is the *only* way to get supplies to some places, and it is the *fastest* way to get supplies to any place." I agree with him.

Stockpiling will of course be necessary in peace time. But the munitions of war on a large scale will be needed at many places not foreseen during planning.

Administration in modern war is no longer a business of assembling large depots of supplies and transport well behind the shield of fighting forces in the forward areas. Long-range air power in the enemy hands will make it impossible to erect sanctuaries for the vast supplies the forces need. We must cut down the tremendous administrative tail the Allies had to drag across Europe in World War II. We must develop methods of sustaining our forces so that the whole system does not collapse if one part of the system is destroyed.

I do not suggest for a moment that we move everything by air, or that air transport could replace our sea life-line in any foreseeable future. Until we have great nuclear-powered air freighters or something of that sort, we shall always need our ships and navies to protect them. Indeed,

as things stand today, if the navies lose control of the seas the Western Alliance would have to go out of business.

But we need air transport on a far larger scale than we have today, to move men and essential munitions of war quickly. These must be moved at the same speed as the battle, particularly the air battle.

### THE ECONOMICS OF DEFENCE

The nations of the Western Alliance are straining under defence budgets which are heavy and painful. Ahead lies a vista of ever-increasing Government expenditure and wage claims. In this country the battle against inflation is on. All nations are looking for ways and means of reducing defence budgets, and in the case of bigger nations, the problem is rendered the more difficult in that they have to be prepared to fight two kinds of war, conventional and nuclear. In general, limited or small wars call for conventional weapons. But once war becomes unlimited and global, nuclear weapons would be used from the outset by both sides.

In war, offence and defence alternate. The attempt to create an adequate organisation *for both* is becoming increasingly expensive. Where is the money to come from to provide all that is needed in this nuclear age?

I consider that we shall build up an adequate defence within the definite limits of economic possibilities only by making a completely new approach to the problem, and by working on the principle of economy of force.

### THE PROBLEM OF THE THREE FIGHTING SERVICES

Let us begin examining the inter-Service problem. That is not so easy to solve; any solution will require firm Ministerial action.

If every nation had only one Service, it would be comparatively simple to determine how that Service should be organised and equipped. But there are three Services, and there will be three Services for many years to come.

I have already said that the dominant factor in warfare today and of the future is air power; offensive air power on a mighty scale, which will make it absolutely clear that war is the quickest and surest way of NOT getting what you want. Atomic air power is the weapon which will deter any aggressor.

Here lies the key to preventing war until man is able to abolish it.

But we now come head-on to a difficult inter-Service problem.

Before air power became a weapon of war, it was reasonably clear in which direction the responsibilities of the armies and navies lay. The navies were concerned with the war at sea, and the armies with the war on land. Even then, navies considered they needed their own soldiers for certain functions, and marines became a part of navies; and still are.

The advent of air power changed the whole scene.

Armies and navies saw, and still see, in air power a way of concentrating great firepower for their particular tasks, a way of distant reconnaissance and of striking the enemy beyond the range of guns.

The cry went up for air forces to support armies, and for air forces to support navies. They each got what they wanted, and some more than others.

This surely is *not* the way to use the decisive instrument of warfare. We want to release the air forces from bondage and forge them into one mighty weapon.

What has gone wrong is that today each Service tries to be self-contained and in a large measure it succeeds. In this struggle between the Services there is duplication, and naturally wastage.

On the other hand, *so long as we have three fighting Services*, there is a need for each Service to have certain additions if it is to carry out its functions efficiently, and this principle must be accepted. Let us examine this problem for a moment.

*Navies* require aircraft for locating and destroying submarines and for the defence of fleets at sea. So far as we can see at present, aircraft cannot be operated economically or efficiently in mid-ocean against submarines, or indeed against raiding cruisers, unless some form of floating airfield can be provided there. For these reasons there may always be a need for vessels from which to operate aircraft. But with progress in vertical take-off and landings, we should aim to design something smaller and cheaper than the present aircraft carrier. We could then dispense with the present form of aircraft carrier, which is very expensive.

There is also a definite role for navies in the offensive use of short-range ballistic missiles fired from submarines, or from ships specially designed for the purpose.

*Armies* need their own limited facilities for intercommunication, for artillery spotting, and possibly for *short-lift* air transport in forward areas. *Armies* also need *long-lift* air transport on a vast scale; but this must be provided by air forces, since it involves the whole realm of command of the air.

*Air forces* need air-sea rescue services, and units of ground airmen to defend their own bases.

### THE LIMITS

Once we go beyond these broad limits, there is no restraint. The Service "empires" expand; overlapping and duplication begins; we at once run into grave financial problems.

If there is an apparent need to go beyond the broad limits I have outlined, then I consider there are three things wrong:—

- (a) The Services do not trust each other.
- (b) Service Chiefs are compelled, possibly against their will, to be protagonists of their own Service.
- (c) Wrong policy or plans have been made.

### CONCLUSION ON ECONOMICS

The above are my views, in outline, on the way we should approach the problem, having in view the definite need to balance expenditure on defence with economic possibilities and practical realities. What it amounts to is that there must be a new approach to the whole problem. But again we run head-on to a different problem. It is this.

The keyword of the old world is tradition; the keyword of the modern world is progress. These two guiding principles are in direct opposition to each other. I hold the view that when the two meet, if a compromise cannot be found it is tradition that must give way. Only by so acting will the new approach be successful.

I am quite certain about one thing. The more we mess about with

old organisations designed for conditions that will not recur, the further we shall get from the right answer.

### NATIONAL SERVICE

There are two more matters to consider; one is National Service and the other Mobilisation.

National Service is an essential feature of modern defence. It was designed initially to meet the conception of "a nation in arms", and the creation of large reserve armies in Europe. The old system depended on adequate warning of war and time for mobilisation. The present system is geared to the old concept; this does not fit the modern picture in Europe.

The first requirement of National Service today is to enable a nation to have highly trained and highly disciplined active forces "in being" in adequate numbers, in peace and war. The second requirement is to provide an adequate trained reserve to maintain the active forces in battle, and to provide disciplined troops to look after the home front.

To meet these requirements, the length of National Service must be sufficient to train the active forces up to the high standard required for a future nuclear war. I do not know if the Services can possibly manage with less men; that would be for them to say. But the men they get need to be kept for two years; this is a military necessity, for the reasons I have given.

It is clear that the object of National Service today in Europe is the reverse of the original conception, and the whole system needs to be examined against the background outlined above.

### MOBILISATION

The object is to put a nation on a war footing as quickly and smoothly as possible. It embraces the whole nation and includes:—

- (a) Mobilisation of the armed forces.
- (b) Mobilisation of the home front, in order to stand the first nuclear shock and to conduct subsequent counter measures.

Present mobilisation schemes are archaic against a background of nuclear war; they are geared to the old concept of a "nation in arms," with adequate warning of war and time to mobilise. Future mobilisation

plans must be geared to the requirements and tempo of a nuclear war, with surprise attacks, and warning reduced to a matter of hours and possibly minutes.

On national radio warning, reservists must know where to report, and must be able to get there in spite of destroyed communications. It is 'time' that will matter, and speed of mobilisation is vital. The immediate requirement will be a certain number of men *very quickly*, and at the right places.

Present mobilisation schemes require overhaul against the background outlined above.

### THE SHAPE OF THINGS TO COME

We are now in a position to be able to suggest some firm conclusions.

A nation must first get its affairs so organised as regards its manpower, its production, and its mobilisation, that it can take the strain easily and quickly if a war crisis should arise. This involves clear thinking on the subject of the armed forces, which have got to be organised within the limits of financial possibilities.

As regards air forces, it is clear that the tremendous destructive power of the nuclear weapon, and the advent in due course of long-range and short-range ballistic missiles, will eventually call for a *decrease* in the numbers of manned aircraft. As we progress scientifically, so we must reduce in manpower and bomber aircraft. One thing, however, is essential: all bombing and ground attack aircraft must carry the nuclear weapon.

Land forces must be organised so that they are linked to an atomic capability. Armies must cease to rely as in the past on a superiority in manpower to overcome the growing power of the defence; they must be organised with *less* manpower and *more* fire power. Supply and maintenance must be based on a larger number of small dumps in forward areas rather than on a few large depots in back areas. It must be understood that fighting on land will be heavy and continuous, and Divisions must be so organised that they can fight effectively for prolonged periods without relief or reinforcement.

It is sometimes considered that the day of the navies is over. I disagree profoundly. Indeed it may well be that the navies will play a definite part in saving us from complete disaster after a heavy surprise attack.



What will happen in the opening phases of a global war in which nuclear weapons are used from the beginning by both sides? Let us examine that problem.

*Air Forces* and their land bases will suffer from surprise attack by ballistic missiles with nuclear warheads, both long-range and short-range.

*Land forces* will suffer also, and their logistic organisation will be gravely disturbed.

On land generally, great destruction will be caused to centres of government, large cities, and communication centres. All movement on land in rear areas will be rendered difficult, and indeed almost impossible for reserve army formations.

*Navies* will escape damage initially so long as the fleets are at sea and suitably dispersed. If they are to escape detection and damage, it is important that they should not constitute too great a strategic threat to the enemy.

The fleets at sea, in being, may therefore be the only undamaged echelon in the armed forces after the initial clash. Later they will be found and attacked. It is essential they should survive such attack, and be available to help the rapid recovery of the situation on land. I believe that the correct organisation of naval forces may well be an important factor in helping to tip the scales in our favour.

The control of sea communications will always remain the priority task for naval forces, the main threats being air and submarine attack.

I suggest that the day of the big ship is over. As I have already stated, navies will always need vessels from which to operate aircraft; in the future, I see these ships being smaller and faster than the present aircraft carrier.

It seems to me that the navies of the future must include, amongst other things, a large number of very fast ships of the cruiser type, specially designed for launching ballistic missiles while at sea.

The utmost use must be made by navies of the rivers and canal systems of Western Europe; craft specially designed as launching platforms for ballistic missiles should be able to penetrate these waterways and assist the land forces in their battle,

## ORGANISATION OF NATIONAL FORCES

I suggest that the organisation of national forces should be undertaken against the background outlined above. In particular, I wish to emphasise the functions and organisations I have suggested for naval forces. Far from having no future, I consider the navies have a future that can be of vital importance; provided they are organised on the right lines, and do not attempt to take on major functions that are more properly the role of other Services.

## ONE FIGHTING SERVICE: NOT THREE?

Looking into the distant future, we must take as our objective bringing the three Services more closely together: even to the extent of combining them into one. Until this is done, we limit ourselves to approaching, but not achieving, an ultimate goal of economy of force in the real sense of the word.

Let us examine this problem.

Progress and development in the modern world have outmoded the old conceptions of the organisation of military forces. But we cannot see this, so strong are our habits and traditions. All the great nations today have three Services—Sea, Land, and Air. This separate existence of the three Services results, in every nation, in waste of money, waste of manpower and waste of time.

If the world were static, and present conditions could be projected indefinitely into the future, there would not be the same urgent reasons for change that exist today, except of course the permanent need for economy of force in manpower, materials, and finance.

But the greatest fact of modern times is that change is inevitable: change in politics, in economics, in techniques, in fact in every field. Progress is not inevitable. Progress depends on courage to make decisions to meet the needs of the times.

The impact of scientific progress makes it essential that we shall be able and ready to adapt ourselves to changes. But the present organisation of military forces is incapable of adaptation to changes, neither quickly, nor economically, nor efficiently.

A factor which influences the problem is the intermingling of func-

tions in modern war. Ground forces require the support of air forces; air forces require protection of their bases; both are served by ships which have to cross the oceans bringing fuel, food and ammunition.

Navies at sea in war and in peace are greatly dependent on flying machines of many types; in addition they can, in many parts of the world, participate directly in the land/air battle with aircraft operated from ships. Today, all these intermingled tactical functions must be co-ordinated by joint staffs, by committees, by agreements between Services. I would add that any agreements reached are always compromises, and are seldom the best and most economical solution.

In basic matters there is continual disagreement between the three Services of a nation, and in some cases there is definite friction. There is hidden suspicion at all levels between the members of all Services, in varying degrees. There is a continual tendency for duplication of administrative services and facilities in all the fighting Services. There is wastage of personnel through the maintenance of obsolete or obsolescent functions in all the Services.

When some function becomes obsolescent, vested interests and emotional attachments go into action to prevent it being abolished, and Service propaganda machines are put into top gear.

The basic reason for all this confusion is wrong organisation. The old feudal system, first of two Services and now three, has existed for too long and even today is not much more than a federation of powerful states. What we need is a system of close integration, with a proper function for each Service, on a co-operative and not on a competitive basis.

It is an inherent characteristic of every organisation to resist change and to attempt to survive. This results from the growth of "vested interests".

But in the future, as political, economic, and technical changes accelerate, *it is a grave question whether any large military organisation which is not closely integrated and gripped tightly at the top can adapt itself successfully to the required speed of modern life.* If this is not done, the lack of adaptability of the organisation as a whole will tend continuously to promote individual Service interests over those of the nation concerned. Under such conditions, politicians have to step in to keep things going; they do this in the only way they know, *i.e.*, by the creation of more committees, and by *additional*

bureaucracies for co-ordination and arbitration above those already existing.

Political leaders have to grapple with these immense problems by themselves; there is no one to give them the right answer, as a Service Chief fights for his own corner.

Each Service has developed within itself a system which provides for specialisation where it is wanted, and yet ensures overall unity in direction.

But the fact remains that we have not achieved for the three Services in combination a system which is comparable to that which each Service has evolved for itself. We had glimpses of the possibilities during World War II when Supreme Commanders were appointed; but these have faded out in the British set-up and we are back with our triumvirate of specialists whenever inter-Service affairs have to be dealt with. It is rather as if a ship were commanded by a committee consisting of the Gunnery Officer, the Major of Marines, and the Engineer Officer, each of whom had under him one third of the crew, and each wearing a different uniform.

It seems to me to be ridiculous to go on in this way. Obviously we cannot today go over to one Service. But we might well introduce such a close integration between the three Services that the final step could be taken without confusion *if it was ever decided it was necessary*.

An essential step would be gradually to produce a new type of senior officer who was trained to be completely inter-Service from his earliest days. This could not be done unless we combined the Service cadet colleges, the staff colleges, and so on, and this I consider might well be done now. The final step would be to abolish the three Services as distinct entities, and organise them into one fighting Service under a single War Department.

I suggest three reasons for this.

*First:* the tasks of the three Services are not nearly so differentiated as they used to be. The Navy flies; the Air Force devotes much of its effort to crippling the enemy's army and transporting our own.

*Second:* the advance of scientific discovery has produced ideas and weapons which do not fit neatly into the picture of the three Services. They tend to unify warlike operations and it is more important than ever before that objective minds should examine the application of science to war.

*And third:* Our nation is going to find it difficult to maintain defence expenditure at the present level. We cannot afford the luxury of duplication, and the waste which comes from adding together the demands of the three Services.

Time will not allow of attempting to answer the host of objections which will immediately be brought against such a scheme as this. No doubt the difficulties will be immense, and Service propaganda machines will make them appear impossible to overcome. Tradition will be put forward as a reason against changes. Tradition is a wonderful thing but it must not become a bar to progress.

The point to note is that the rewards for success, and the penalties for inaction are so great that something must be done : and done immediately. The changes would produce an equally good defence organisation, indeed it would be better. And the financial gains would be tremendous, resulting eventually in reduced taxation and a better standard of life for all.

#### THE RIGHT ORGANISATION AT THE TOP

It is clear that there is much to be done to get defence organisations geared to the requirements of future war. Whatever is done must begin at the top. If the organisation there is right, progress will be possible. If the organisation at the top is faulty, there will be no progress.

It would be impossible to carry through a major reorganisation of the defence needs of a nation, on the lines I have suggested, with the present set-up that exists in some nations. I refer to the committee system of management. A good example of that system is found here in London, where at the top is a Minister of Defence who is merely a "persuader", with no real power; and right down the chain the professional side of defence is run by committees, boards and councils. The committee system of management is out of date as far as defence is concerned; it is totally unsuited for modern times.

A Minister of Defence has got to produce a sound defence with the right balance between air, sea and land forces : all within definite financial limits. He will never achieve any economy so long as all he can do is to add together the demands of the three Services. He can achieve nothing in these matters unless he has power of decision.

In modern times, a nation needs a Defence organisation on the following general outline.

(a) A Minister of Defence, who has real power of decision and action within the limits of Cabinet policy. He should be responsible for air, sea and land forces, and also for civil defence.

(b) An Under-Secretary in each Service Ministry; these would direct the organisation and administration of their Services in accordance with the definite instructions of the Minister of Defence.

(c) A Chief of Staff of the Armed Forces, who would be the professional adviser to the Minister of Defence. He would issue orders to the three Services Chiefs on defence matters and must have the power of decision in case of disagreements. He must, of course, be completely inter-Service on all matters.

(d) A Chief of Staff of each Fighting Service who would be the sole professional adviser to his Under-Secretary.

Today it is impossible for a Head of Government or Minister of Defence to get true and unbiased inter-Service advice. Under the above system the Chief of Staff of the Armed Forces would give such advice.

The first and essential appointment is to make a Chief of Staff of the Armed Forces. It would then be necessary to work out the details of the modern system and to draw up the legislation necessary to give effect to it. The power of decision is then placed in the hands of the Minister of Defence, and Service empires disappear.

I suggest that under the above system responsibility would be clear-cut, argument and vested interests would be stamped on, and things would get done. And after all, this is what we want; to get things done the right way, and quickly.

#### CO-OPERATION WITH THE SCIENTISTS

Let us take a quick glance at the future. I consider that this lies in the hands of the men of science.

Today some of us may feel we are living in the era of ultimate weapons. I suggest we are really in a transition period. There is much more to come.

Within the next five years the guided missile will be with us. Within the next ten years there will be an operational inter-continental ballistic rocket carrying a nuclear warhead. Never has it been so necessary for

the fighting men and the scientists to work closely together, and for the Service Chief to say clearly what he wants from the Scientist.

In my address here last October, I quoted the following verse from the Old Testament: "If the trumpet give an uncertain sound, who shall prepare himself to the battle". (1 *Corinthians*. 14, 8) I often think that today when Service chiefs talk to the scientists, the trumpet gives out a most *uncertain* sound.

Shortly after the ballistic rocket will come the unmanned satellite.

I read recently in a newspaper a statement by a scientist that there is no sound military requirement for this device. I disagree profoundly. I remember a statement made some 40 to 50 years ago: "There is no sound military requirement for the aeroplane." What these statements really mean is that man's imagination is deficient. A few years hence we will look on such a statement about the Satellite as rubbish.

The military requirement is that a large unmanned satellite could contain television, photographic and communication equipment. It could televise pictures of world-wide cloud formations thus allowing the continuous location of storm centres and areas of good weather. This capability to view the weather from above as well as below would advance meteorology; such an advance would have military value, particularly for air operations.

The satellite could look down on any desired area several times in each 24 hours. The information thus gained would depend on the state of development of radar, visual optics, and television technology. The pictures taken would be automatically developed and sent back to earth by radio. The advances that would accrue to mankind in general, and to the military in particular, are of course impossible to predict accurately. If they could be predicted we would not need the satellite.

It is clear that there would be advances; some of them might completely overshadow all advances up to date. In any case, the scientists would get a fresh unhampered view of the earth.

#### THE CONCLUSION OF THE WHOLE MATTER

In this address I have put before you the organisation for defence that, in my view, is essential in modern times. You will have gained the

impression that if some criminal lunatic should loose war on the world, the Western Alliance would win so long as we have the right organisation and the right forces. That is better than thinking we would lose.

I now put it to you that the words "win" or "lose" no longer apply to contests between nations which have nuclear power of any magnitude. If attacked, our aim must be to impose our will on the enemy. But the price will be heavy.

I have been studying nuclear war for a considerable time and I have come to the conclusion that man will have it within his power in the future to destroy himself and every living thing in this planet. I do not believe this to be man's destiny. But we must face the facts *now*, or it will be.

War is not an act of God. War grows directly out of the things which individuals do or fail to do. It is, in fact, the consequence of national policies or lack of policies. Do not let us fail to do the right things now. Our aim must be to prevent war; the prospect of winning or losing is not a profitable subject. We must find another court of last resort for adjusting political differences.

You may say: "How can we prevent war? Man has been warring since the dawn of history. Why should he change his ways now? Man will, as far as one can foretell, always make war unless there is some powerful deterrent to prevent him."

Here lies the key to our problem.

The *banning* of nuclear weapons will not give us peace. We will get lasting peace only *by having* the nuclear deterrent, as no nation will risk its own utter destruction by bringing on a nuclear war. But there must be no hanging back, no flinching in the crisis; the unflinching deterrent will produce peace.

What then has to be done to ensure that war will be categorically unprofitable?

This question is not easy to answer. But the 'Pax Atomica' should be the basis of the plan, until man can bring about the abolition of war as a means of settling international disputes: which is a problem for the political leaders to solve.



Then I suggest that if we can give sound solutions to two simple questions, we Service Chiefs will have given our contribution to the answer.

The two questions are:

*First:* How should the armed forces be organised in order to achieve maximum strength and thus act as a positive deterrent to war?

*Second:* How is this best done within the limits of economic possibilities?

In the address I have given you, I have endeavoured to point the way towards the answers to those two questions.

#### SUMMARY

As far as I can see, in any global war that may come upon us in the foreseeable future, air power will be the dominant factor. This fact being acknowledged, it will then be necessary to ensure a proper balance between air, sea and land forces. I would like particularly to mention the necessity for German land forces in the Western Alliance on the scale now planned.

As air forces develop through the jet bomber to the ballistic missile and the satellite, the world balance of power will become progressively more precarious. We must build up a powerful deterrent to war as our first object; having done that we must seek to bring about some measure of world-wide disarmament.

We must get the right organisation for modern defence from the Minister of Defence downwards. That organisation must be one which gives power of decision to the Minister of Defence and to his Chief of Staff of the Armed Forces.

Having got the right organisation at the top, we must bring about a very close integration of the three Services, welding them together on a co-operative basis.

Overall, we must tackle the economics of defence as a matter of urgency.

Finally, we must understand that we are in the midst of a scientific revolution and we cannot stand still or put the clock back. We must go forward into the future, working for a sound balance between tradition and progress.

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## SHIPBUILDING IN INDIA

COMMANDER F.C. HYTTEN, I.N.

**S**HIPBUILDING is among the most ancient of arts. The idea was probably suggested to primitive man by the floating of a fallen tree bearing some animal upon the water. The first boats were undoubtedly made very early indeed in the Neolithic stage of culture (over 10,000 B.C.) They were no more than trees and floating wood, but in time, by way of a raft or catamaran, and certainly by means of a hollowed tree-trunk, canoes and coracles were evolved.

In the valleys of the great rivers, boats must have early become an important means of communication. There were not only canoes, but Sumerian boats and ships upon the Euphrates and Tigris, as far back as 7,000 B.C., when these rivers fell by separate mouths into the Persian Gulf. It seems natural to suppose that it was from the mouths of such great rivers that man, already in a reasonably seaworthy vessel, first ventured out upon what must have appeared to him then the vast and trackless ocean.

## SHIPBUILDING IN ANCIENT INDIA

The old maritime activity of the Indians make fascinating reading. All the evidence available clearly indicate that for full thirty centuries, India stood out as the very hub of maritime activity, cultivating trade relations successively with the Babylonians, Phoenicians, Jews, Greeks, Egyptians and Romans in ancient times, and with the Turks, Venetians, Portuguese, Dutch and English in modern times. The paramount part played by Indian built ships in the expansion of Indian commerce and colonisation from the shores of Africa and Madagascar to the farthest reaches of the Malayan Archipelago is everywhere evident—in ancient writings, in paintings and sculptures both in and outside India, and in buried remains that have been dug up from time to time.

The early growth of Indian Shipping and shipbuilding, coupled with the genius and energy of her merchants and the skill and daring of her seamen, secured for India the command of the sea for many centuries.

Ancient Sanskrit writings prove the early existence of a complete navigation of the Indian Ocean and the trading voyages of India. The oldest evidence on record is supplied by the *Rig-Veda*, which contains several references to sea voyages. One of the most interesting passages in this respect mentions a naval expedition on which Tugra, the Rishi King, sent his son Bhujyu against some of his enemies in the distant islands. Bhujyu got shipwrecked in a storm and was rescued by the twin Asvins in their *hundred-oared galley*.

The trade of the *Rig-Veda* was very probably that carried on with countries to the west, like Chaldaea, Babylon and Egypt. Eminent Assyriologists believe that commerce by sea between India and Babylon must have been carried on as early as about 3000 B.C. Other ancient works deal extensively with shipbuilding in ancient India. The types of wood most suited for ship construction are dealt with fully and ships are elaborately classified according to their size and the purpose they are intended to serve. There are described ships suited for the transport of royal treasure, horses and women; ships for pleasure trips by kings, and ships for long voyages and naval warfare—perhaps the type of ship on which Bhujyu set out on his ill-fated expedition.

The two epic poems, the *Mahabharata* and the *Ramayana*, also contain many references to naval activity. The *Mahabharata* in particular refers to the escape of the Pandava brothers from the destruction planned for them, in a "ship specially constructed for the purpose with machinery and all kinds of weapons of war, and able to defy storms." This early maritime activity of India is further supported even by the Bible. In the Book of Genesis there is mention of traders bearing spicery, balm and myrrh going to Egypt. The spicery had undoubtedly come from India. Solomon, in 1015 B.C., could obtain from India alone the "ivory, spices and peacocks" held in such high regard.

#### THE MAURYA PERIOD

From the age of the Mauryas, which is taken to begin roughly from the date of Alexander's Indian campaign, about 325 B.C., Greek writers have recorded interesting information about Indian naval activity. When the Greeks invaded India, the indigenous shipbuilding industry was already flourishing. When Nearchus, sailed down the Indus with the remnants of Alexander's army, a reliable estimate puts down the number of vessels employed at no less than 2,000, which between them carried

8,000 troops, several thousand horses, and vast quantities of supplies. This extraordinarily large fleet was built entirely of Indian wood and by Indian craftsmen.

It is interesting to note that in the Maurya era, shipbuilding in India was in the hands of the state, and was in fact a government monopoly. Naval architects and shipwrights were salaried public servants and were not permitted to work for private persons. Completed ships, however, were let out on hire, both to merchants and to adventurers.

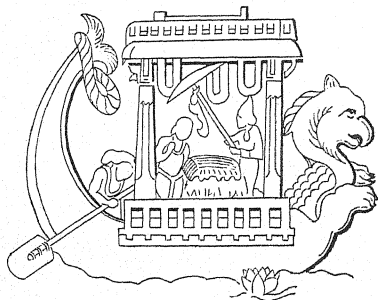
In the reign of Emperor Chandra Gupta ( 321 BC to 292 BC ) the development of national shipping was watched over by a " Board of Admiralty " which seems to have been very well organized. They were entrusted with all matters relating to navigation, including the payment of port dues, the drawing up and enforcing of harbour regulations and the safety of ships and passengers.

In the days of Asoka ( 264-228 BC ) it was the availability of an efficient national shipping and system of communication that made possible the spread of the gospel of universal brotherhood that made India the spiritual centre of the Old World.

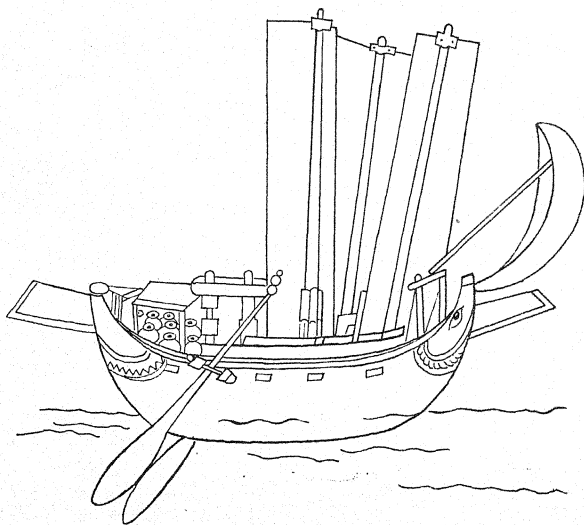
#### EARLY SCULPTURES AND PAINTINGS

The existence of many old sculptures has preserved, to this day, direct evidence of the types of ships used in ancient India. The earliest of such sculptures are found in Sanchi and belong to the second century B. C. One of the sculptures represents a canoe made of rough planks rudely sewn together, by hemp or string. Another sculpture shows a barge with a prow shaped like a winged gryphon and the stern like a fish's tail. The Kanheri caves in Salsette near Bombay, contain sculptures dating back to the second century A.D. depicting the scene of a shipwreck at sea—perhaps the oldest representation of a sea voyage in Indian sculpture.

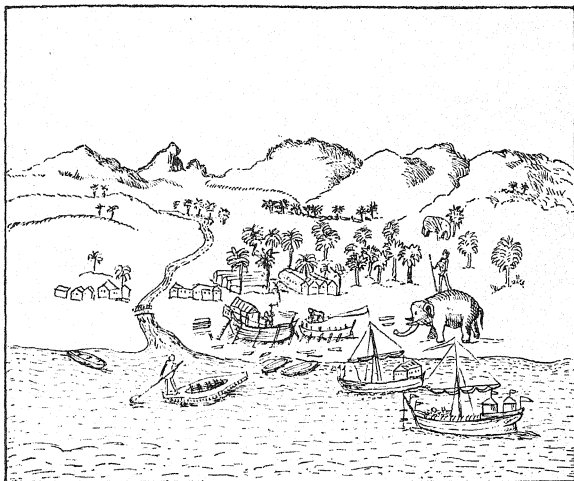
Many representations of ships and boats are found in the paintings of the Ajanta caves. These paintings are placed between 525-650 A.D. They bear vivid testimony to the ancient foreign trade of India. They show sturdy sea-going ships and royal pleasure boats. In the Ajanta caves is also represented a scene of the landing of Vijaya in Ceylon, with his army and fleet, which is said to have carried no less than 1500 passengers. In the South, in the great Meenakshie temple at Madura,



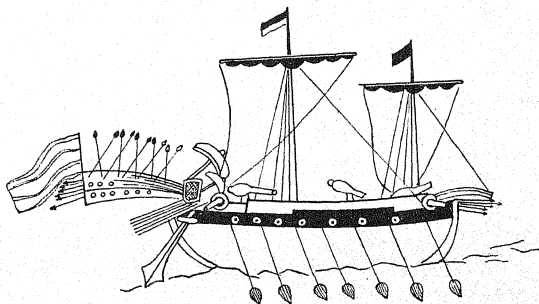
Sculptures from the Sanchi Stupas (2nd Century B.C.)



A sea-going vessel from paintings in the Ajanta Caves  
(6th Century A.D.)



A European traveller's impression of Calicut in the  
16th Century.



Man-of-War Prow (17th Century)

among the fresco paintings that cover the walls of the corridors is a fine representation of the sea and of a ship in full sail, magnificent in design and movement.

Similar ships of the 6th and 7th century are found among the splendid sculptures of the Temple of Borobudur in Java. Most of the sculptures show in relief fine ships in full sail and recall the history of the colonization of Java by Indians early in the Christian era. Ships are seen sailing tempest tossed seas, a marvel of the shipbuilders' art, and fully taxing the courage and skill of oarsmen, sailors and navigators, who, however, by their casual expressions appear quite equal to the occasion.

#### RECORDS OF FOREIGN TRAVELLERS

Another valuable source of information on Indian shipping activity is the writings of foreign travellers who visited India at various times. The first of them of whom we have records, were the Chinese pilgrims who visited India in the 7th Century A.D. There was much comings and goings between Indian and Chinese Buddhists during this period, and sailings between the two countries appear to have been very regular.

Marco Polo, that intrepid Venetian traveller who has left us an invaluable record of his travels, has much to say about shipbuilding in India during the 13th century. His very first chapter dealing with India is devoted almost exclusively to her shipbuilding industry. He has a fascinating tale to tell:

"We shall commence with a description of the ships employed by the merchants, which are built of fir-timber. They have a single deck, and below this the space is divided into about sixty small cabins, fewer, or more, according to the size of the vessel, each of them affording accommodation for one merchant. They are provided with a good helm. They have four masts, with as many sails, and some of them have two masts, which can be set up and lowered again as may be found necessary. Some ships of the larger class have as many as thirteen bulk-heads or divisions in the hold, formed of thick planks mortised into each other. The object of these is to guard against accidents which may occasion the vessel to spring a leak, such as striking on a rock or receiving a stroke from a whale. The crew, upon discovering the situation of the leak, immediately remove the goods from the division affected by the water, which, in consequence of the boards being so well fitted, cannot pass from

one division to another. They then repair the damage, and return the goods to their place in the hold.

"Ships of the largest size require a crew of three hundred men; others, two hundred; and some, one hundred and fifty only, according to their greater or less bulk. They carry from five to six thousand baskets of pepper.

"The vessels are likewise moved with oars or sweeps, each of which requires four men to work it. Those of the larger class are accompanied by two or three large barks, capable of containing about one thousand baskets of pepper, and are manned with sixty, eighty, or one hundred sailors. These small craft are often employed to tow the larger, when working their oars, or even under sail, provided the wind be on the quarter, but not when right aft, because, in that case, the sails of the larger vessel must becalm those of the smaller. The ships also carry with them as many as ten small boats, for the purpose of carrying out anchors, for fishing, and a variety of other services. They are slung over the sides, and lowered into the water when there is occasion to use them. The barks are in like manner provided with their small boats.

"When a ship, having been on a voyage for a year or more, stands in need of repair, the practice is to give her a course of sheathing over the original boarding, forming a third course, which is caulked and paid in the same manner as the others. When she needs further repairs this is repeated, even to the number of six layers, after which she is condemned as unserviceable and not seaworthy".

In the 14th Century, in an account of the journeys of Friar Odoric (AD 1321), an Italian Monk who travelled over the greater part of Asia, mention is made of his voyage across the Indian Ocean in a ship that carried 700 people—a striking proof of the capacity and maritime skill of the Rajput sailors of Gujarat who could successfully build and manage such huge vessels.

Nicolo Conti who visited India early in the 15th Century was obviously greatly impressed by the standard achieved by Indian Shipping. He wrote: "The nations of India build some ships larger than ours; capable of containing 2,000 butts, and with five sails and as many masts. The lower part is constructed with triple planks, in order to withstand the force of the tempests to which they are much exposed. But some ships



are so built in compartments that should one part be shattered, the other portion remaining entire may accomplish the voyage”.

Varthenia, another foreign traveller, has also thrown some very interesting light on the shipbuilding activity at Calicut, that great shipping centre of the 16th Century: “first they make their vessels, such as are open, each of 300 or 400 butts”, he wrote, “and when they build the said vessels they do not put any oakum between one plank and another in any way whatever, but they join the planks so well that they keep out the water most excellently. And then they lay on pitch outside, and put in an immense quantity of iron nails. They also possess as good timbers as ourselves in greater quantity than with us. The sails of these ships of theirs are made of cotton and at the foot of the said sails they carry another sail, and they spread this when they are sailing in order to catch more wind; so that they carry two sails where we carry only one”. As to the names of their ships, some are called *Sambuchi*, and these are flat-bottomed, some others, which are made like ours, that is in the bottom, they call *Capel*”.

Yet another 16th Century traveller, the Venetian Cesare de Fedrici, referring to the east coast, made mention of the existence of such abundance of materials for shipbuilding in that part of India that the Sultan of Constantinople found it cheaper to have his vessels built in India than at Alexandria.

#### THE MOGUL PERIOD

The 16th Century certainly witnessed a remarkable outburst of naval activity under Akbar who established an imperial naval establishment centered in Bengal, and had framed elaborate regulations for the organization of a “Naval Department” or Admiralty, remarkably similar to that drawn up by Chandra Gupta already referred to. The Imperial flotilla consisted of over 3,000 vessels.

The Mogul government maintained a very strong fleet in Dacca. In the reign of Aurangzeb, Mir Jumla who came to Bengal as viceroy in 1660, took a keen interest in naval exploits.

In 1662 he embarked on his conquest of Assam with a large force consisting of infantry and artillery and the Nowwara or fleet of 323 ships of various descriptions. Though the Assamese put up 800 ships in opposition, timely reinforcements decided the issue in favour of the Moguls.

After Mir Jumla's death the Bengal flotilla was utterly ruined, but in 1664 Shaista Khan became viceroy and he devoted all his energy to rebuilding the flotilla. To speed up the work he sent bailiffs to every district of the province that had timber and carpenters, with warrants to take them to Dacca. He appointed trusted overseers to superintend the work, and as a result of his ceaseless exertions 300 ships were built and equipped in a very short time.

In the time of Aurangzeb there was a marked development in shipping activity in other parts of India also. Masulipatam was the great trading and shipping centre at the time. Narsapore, 45 miles north of Masulipatam, was also important as it "aboundeth well in timber and conveniences for the building and repairing of ships", and was already "well known more than two centuries ago for its docks for the building and repair of large vessels".

Madapollum was yet another shipping centre. Thomas Bowrey, an English traveller to India during 1669-1679, wrote that: "many English merchants and others have their ships and vessels yearly built (at Madapollum). Here is the best and well grown timber in sufficient plenty, the best iron upon the coast, any sort of ironwork is ingeniously performed by the natives, as spikes, bolts, anchors, and the like. Very expert master-builders there are several here, they build very well, and launch with as much discretion as I have seen in any part of the world. They have an excellent way of making shrouds, stays, or any other rigging for ships".

#### THE MAHRATTA POWER

The growth of the Mahratta power was accompanied by the formation of a powerful local fleet. Several docks were built where men-of-war were constructed. In 1688 Kanoji Angre succeeded to the Command of the Mahratta Navy and under him the Mahratta naval power reached its zenith. Kanoji died in 1729 and was succeeded by Sambhaji Angre who carried on his harassing policy. In 1743 Sambhaji was succeeded by Toolaji Angre who became very powerful and swept the coast of India from Cutch to Cochin. The superior sailing powers of the Mahratta vessels enabled them to keep out of range of the big guns of the European giants and Toolaji wrought much havoc on English and Dutch men-of-war before he was finally defeated at Gherriah by a carefully planned and formidable expedition led by Admiral Watson and Clive.

The Angrian fleet, at the time, was said to consist of "three-masted ships carrying twenty guns each, nine two-masters carrying from twelve to sixteen guns, thirty other unclassified, two on the stocks, one of them pierced for forty guns".

The following is an eye-witness account of Toolaji's ships: "His fleet consisted of grabs and gallivats. The grabs have rarely more than two masts. They are very broad in proportion to their length. On the main deck under the forecastle are mounted two pieces of cannon of nine or twelve pounders, which point forwards through the portholes cut in the bulkhead and fire over the prow; the cannon of the broadside are from six to nine pounders. The gallivats are large-row-boats rarely exceeding seventy tons. The gallivats are covered with a spar deck, made for lightness of split bamboos, and these only carry pettera roes, which are fixed on swivels in the gunnel of the vessel; but those of the largest size have a fixed deck on which they mount six or eight pieces of cannon, from two to four pounders. They have forty or fifty stout oars, and may be rowed four miles an hour. Eight or ten grabs and forty or fifty gallivats, crowded with men, generally composed Angre's principal fleet, destined to attack ships of force or burthen."

#### THE EAST INDIA COMPANY

And thus ended, for virtually two centuries, Indian controlled shipbuilding. In 1669 the Court of Directors of the East India Company had appointed a Mr. Pett as their shipbuilder at Bombay. A building yard was maintained in Surat till 1735, when most of the work was transferred to Bombay. This was the beginning of the association of the famous Parsi shipbuilders with the Indian and Imperial Navy services. Lowjee Nasseranjee, the foreman of the Surat shipyard, followed the establishment from Surat to Bombay, and the history of this dockyard is that of the rise of the talented Parsi family. The size of the yard was increased in 1757 and in 1771 Lowjee introduced into it his two grandsons, Framjee Manseckjee and Jamsetjee Bomenjee who succeeded Lowjee when he died in 1774. They soon built two ships of 900 tons and it was under the supervision of these skilled Parsi shipbuilders that in the latter part of the 18th and earlier part of the 19th Century, nine ships of the line, seven frigates, and six smaller vessels were built for the Royal Navy, in addition to those built for the Bombay Marine. Thus, "in 1802 the Admiralty ordered men-of-war for the King's Navy to

be constructed at this spot. They intended to have sent out a European builder, but the merits of Jumsetjee being made known to their lordships, they ordered him to continue as master-builder".

Lieut. Col. A Walker in his paper "Considerations on the Affairs of India", wrote in 1811 of the Bombay docks and Bombay-built ships: "The docks that have recently been constructed at Bombay are capable of containing vessels of any force. Bombay is our grand naval arsenal in India." Bombay possessed great natural facilities for the construction of ships, for, "situated as she is between the forests of Malabar and Gujarat, she receives supplies of timber with every wind that blows". Besides, the teakwood vessels of Bombay were greatly superior to the oaken walls of Old England. Walker went on to say: "It is calculated that every ship in the Navy of Great Britain is renewed every twelve years. It is well known that teakwood built ships last fifty years and upwards. Many ships Bombay-built after running fourteen or fifteen years have been brought into the Navy and were considered as strong as ever. The *Sir Edward Hughes* performed, I believe, eight voyages as an Indiaman before she was purchased for the Navy. No Europe-built Indiaman is capable of going more than six voyages with safety". But Bombay-built ships were superior to those built elsewhere not only in point of durability but also in that of cheapness. "Ships built at Bombay", observed the same writer, "also are executed by one-fourth cheaper than in the docks of England, so that the English-built ships requiring to be renewed every twelve years, the expense is quadruple".

The East India company also helped to build up the Bengal Marine, thus continuing, in a sense, the work of the Mogul Emperors. Calcutta soon became the centre of regular shipbuilding. The earliest Calcutta-built ships were produced in 1781. From 1781 to 1800, thirty-five ships were built with a total tonnage of 17,020. From 1801 to 1821, 237 ships of 105,693 tons were built on the Hooghly, reckoned at an average cost of Rs. 200/- per ton. The first dry dock constructed at Calcutta was a small one at the Bankshall in 1790 for the Government pilot vessels. Subsequently several large docks were constructed at Howrah and Sulkea. In 1803 the Kidderpore dock was founded by Mr. W. Waddell, the Company's first master-builder, who was succeeded by J. and R. Kyd, and who for nearly thirty years built and repaired all the Company's Bengal vessels and constructed as many as twenty-four fine ships.

The decline of the Indian Marine began after 1840 after which date

no large ships were built. The Indian Marine was finally abolished in April 1863, shortly after the assumption of the Government of India by the British Crown.

### TODAY

And what of today ? The advent of steam and steel walls that have ruthlessly ousted the wooden walls of old, has left India severely handicapped. Whereas she had the best timber in the world her industrial backwardness made it impossible for her to enter the modern shipbuilding field. With her iron and steel production on the increase, however, she is once again picking up the threads of a lost industry. In fact, it was early in this century that attempts were made to resuscitate the shipping industry but fierce competition and the lack of essential raw material and complicated equipment killed the nascent attempts. But tenacity of purpose and a refusal to be discouraged at last resulted in the establishment of the Scindia Steam Navigation Co. in 1920, and that may be regarded as the birth of modern Indian shipping.

With independence, the rapid development of Indian shipping and Indian shipbuilding became an accepted objective of State policy and the resources of the country were directed to this purpose. As a measure of encouragement to shipping in overseas trades, and with a view to setting up a precedent, the Government of India sponsored the launching of the "Eastern Shipping Corporation" with a majority share. This was the first attempt in modern India at direct participation in shipping by the State. The Corporation is now operating five vessels aggregating 32,689 G.R.T. and its newest undertaking is the launching of the India-East Africa passenger-cum-cargo service.

The second major step taken was that of the launching of another Corporation which took over the shipbuilding yard at Visakhapatnam. The Government of India hold two-thirds of the shares in this corporation. The Yard has so far completed twelve seagoing ships and is at present fully engaged. There are four construction berths in the Yard, and whereas previously the yard could construct only the standard 8,000 tonners, after recent modernisation it is now capable of constructing larger vessels of different types. The capacity of the Yard is however not yet adequate for India's requirements and purchases are still being made from abroad. Construction costs are naturally high compared to costs elsewhere, since the undertaking is new. The industry is, however, of national impor-

tance, particularly from the security and self-sufficiency point of view, and the Government have therefore undertaken to meet from the general revenues the difference between the cost of construction of a ship in India and the comparable cost of construction in the U.K.

A third, and very important step towards sustaining shipbuilding in India, was taken in August 1950 when coastal trade was reserved for Indian shipping, for it is Indian shipping companies that must nurture and help her shipbuilding industry. In time to come, when the industry has overcome its teething difficulties, and is able to stand on its own feet, backed and fed by an industrialized India, it is more than likely that she will be able to sell ships to other countries. After many vicissitudes, therefore, Indian shipbuilding can once again be said to be looking up, and it is not altogether fantastic to visualize that she may, one day, regain the position in this sphere that she once, in years gone by, so proudly maintained.

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## A PLEA FOR THE 2-INCH MORTAR

LIEUT. COLONEL BALWANT SINGH

ONE of the unhealthy effects of the last war has been that the great majority of junior officers are dabbling with the problems of generals and field-m Marshals to the neglect of smaller problems which immediately concern them. Junior officers have to be reminded of the necessity of attending to small things which ultimately decide the success or failure of a major operation, campaign or enterprise. Just as in any machinery no component, however small it may be, can be neglected, so in the machinery of war no small detail is too small to be overlooked. The object of this article is to plead the cause of the 2-inch mortar, for a proper team of four men to man it, instead of one man as authorised at present.

The 2-inch mortar is a hollow tube of about 2 inches in diameter and about 20 inches in length, weighing about 9 lbs. It has sufficient strength to withstand the force of explosion capable of propelling a 2-lb bomb to a distance of 500 yards, and has the necessary firing mechanism at the bottom and a base.

The Infantry Platoon is at present equipped with 3 LMGs, 8 or so sub-machine guns and 30 or so rifles, 3 grenade dischargers and one 2-inch mortar as its armament. All these weapons except the 2-inch mortar and the dischargers are meant for direct hitting, *i.e.*, the firer and target have to be intervisible. As it happens in practice all the targets in the field are not visible due to the lie of the land and due to clever use of ground made by the enemy who invariably sites his weapons in such a way that they are capable of inflicting casualties while themselves remaining immune to direct fire. Only weapons which fire high into the air and their missiles falling on to the target behind the cover are capable of neutralising such weapon positions. Such enemy positions can be destroyed by bombing from air or by artillery howitzers and by heavier types of mortars. At times it is not possible to use these big weapons due to the proximity of our own troops to the target. The bigger the weapon the greater the time and effort it requires to get going. It would not be economical to use air and howitzers where a smaller weapon can do the needful.

Our infantry is equipped with 2 and 3-inch mortars. The 3-inch mortar, in comparison with the 2-inch mortar, takes longer time and effort to bring its fire on the enemy and the margin of error is much greater, *i.e.*, it should not be fired within 500 yards of own troops. The 2-inch mortar, on the other hand, does not suffer from this handicap as it can, if needed, be placed right in the front line itself. Given a good team it can pump at the rate of 15 lbs of bombs a minute on an enemy position when once fairly located. The bigger the weapon the further behind the front line it has to stay.

The previous models of the 2-inch mortar had either prismatic or open sight attachments to the barrel for aiming, but these have now been dispensed with. The weapon is at present fired wholly and solely by sheer sense of judgement (for direction and elevation). There is no other weapon which is fired by sense of estimation at such long range. One can argue that sub-machine guns are also fired by sense of judgement but the range in this case is almost negligible and the greater volume of fire compensates for errors in judgement. The firing of 36 Mills' grenade by rifle discharger is comparable to some extent. The range in this case is controlled by increasing and decreasing the gas vent and the rifle is kept at the constant angle of 45°. Indirect fire, though theoretically possible, is neither taught nor practised with 36 Mills' grenade.

The 2-inch mortar is capable of giving direct and indirect fire. In direct fire, as already stated, the firer and the target are intervisible. It follows, therefore, that the enemy at the target position has equal chance of hitting back. On the other hand in the case of indirect fire the firer and the target are not intervisible and the position of the target is indicated by another person who places himself in a position from where he can see the target and the firer. Because of this quality, which is the prerogative of the artillery, and the high rate of fire that this weapon is capable of, it has been called the Infantry Platoon Commander's artillery. This artillery can fire from the front line whereas other artillery fires from far behind the front line as already stated.

The 2-inch mortar fires the following types of bombs:—

(a) **H.E. (high explosive)**

This bomb on contact with the ground after firing explodes and splits into small and big splinters which are effective up to about



10 yards from the point of explosion, but heavier pieces are effective even at longer distances.

**(b) Smoke bomb**

One bomb is capable of producing an effective screen against a section post for about 2 minutes. Smoke enables the troops either to screen their own positions or to blind enemy's posts.

**(c) Illuminating bomb**

This bomb is capable of illuminating the area for about 2 minutes.

**(d) Signal bomb**

This contains different types of coloured illuminating material and is used for various coded signals.

The firing technique is different for each type of bomb.

The Germans, as far back as 1940, as a result of their experience in the Polish Campaign, organised their rifle Platoon as below:—

*Platoon HQ*

Platoon Commander—(Officer)  
Platoon second-in-command—(Serjeant)  
2 Orderlies  
Bugler.

*Four LMG/Rifles Sections each*

Section Commander  
9 men (1 to 3 LMG and 4 to 8 Rifle-men)

*One light mortar section*

Section Commander  
2 men

The point to note here is the composition of the light mortar section which is equivalent to our 2-inch mortar.

Our Infantry Platoon at present is organised more or less as below:

*Platoon HQ*

Platoon Commander (JCO)  
Platoon second-in-command (Havildar)

Runner (sepoy)

2-inch mortar detachment (1 or 2 sepoys)

*Three rifle sections each*

Section Commander (Naik)

9 sepoys

It may be noted that in our infantry battalion establishment we authorise only one sepoy as 2-inch mortar member and our training pamphlets recommend 2 to 3 whereas, in my opinion, the actual requirement is of one NCO and 3 men. The necessity for these numbers will be evident from an examination of the duties which a team should perform to function efficiently. The tasks the 2-inch mortar section has to perform on the field are as follows:—

**(a) Carriage of 2-inch mortar and 36×2" bombs**

This load, if it has to be carried under field service conditions, requires at least 4 men with the load distribution as below:—

*Section Commander*

Personal weapon (machine carbine)

Binocular—2 lbs

6 Bombs—14 lbs

*No. 1*

Personal weapon (pistol)

2-inch mortar piece—9 lbs

6 bombs—14 lbs

*Nos. 2 and 3 each*

Personal weapon (Rifle)

12 bombs—28 lbs

One has still to come across a jowan who can carry 12 bombs and yet keep pace with the rest of the platoon. The total weight on a man carrying 12 bombs and his personal equipment is 65 lbs against the average of 50 lbs for others in the platoon. The Section Commander and No. 1 should carry lighter loads in comparison with the rest of the team so as to be able to get into action quicker and negotiate difficult places. Finally no one when panting for breath can fire a weapon accurately; this aspect has to be kept in view too.

**(b) Firing the weapon**

The Section Commander controls and directs the fire to the desired target either on his own initiative or on the orders of the Platoon Commander and he also acts as an observer in the case of indirect fire. No. 1 actually mans and fires the weapon. No. 2 prepares and supplies the necessary ammunition and helps No. 1 if need be to relay the orders of the Section Commander. No. 3 holds the ammunition which is not required at the mortar position.

**(c) Local protection**

To make the best use of this detachment at times it may have to go into places where it may not be protected by own troops. In such cases it is necessary that the observer and the firers should not be worried about their own protection. The observer, and Nos. 1 and 2 will be able to concentrate on the task in hand if they know that No. 3 is carrying out local protection for them.

It will be seen therefore that a 2-inch mortar team or section should consist of at least one Section Commander, who should be an NCO, and 3 sepoys. It will also be seen that all the individuals in the team are fully utilised at all times.

It is only by hard and continuous training that the detachment can become proficient in the use of this weapon instinctively; it has to be instinctive firing as there are no sights. The standard to be aimed at should be that a team can hit the target with the second bomb under normal weather conditions in the case of direct fire, and with the third bomb in the case of indirect fire, but it is doubtful if such a state of affairs exists. I know of an occasion when a team of selected NCOs could not get on to the target even with 7 bombs whereas an officer directed by another officer got on to the target with the second bomb. While it is admitted that the effects of weather are very pronounced on this weapon, it is felt that on a normal day a well-trained man should be able to get on to the target as stated above. This weapon, therefore, calls for far more intensive and acute training than any other weapon, but unfortunately this is the only weapon which is without a master and is left to the whims of sepoys. One may argue for argument's sake that there is a Platoon Commander and Company Commander on top. The answer

is that the Platoon Commander has to look after the platoon as a whole and has not got the time to attend to this weapon as his whole-time duty. If a Platoon Commander is considered capable of looking after this weapon there is no reason why there should be Section Commanders for LMG/rifle sections. As it stands its detachment does not produce good results and the weapon is economically a liability.

A rough comparative estimate of the financial effects of the ammunition fired by the 2-inch mortar and the LMG is:—

<i>Weapon</i>	<i>Cost</i>	<i>Rate of fire per minute of normal action</i>	<i>Expenditure per minute of normal action</i>
LMG	Rs. 20/- per 100 rds	50	Rs. 10/-/-
2-inch mortar	Rs. 20/- per bomb	5	Rs. 100/-/-

It will be clear that an incompetent mortar crew in action can fire off in a minute 10 times the cost in terms of money as compared to an LMG and yet not achieve any results. The loss will correspondingly increase as the number of mortars and minutes of action increase. For example the loss for thousand mortars in 100 minutes of action will be Rs. 1,00,000 (one lakh). In view of the cost alone it is desirable that a responsible and efficient person be put in charge of this weapon and that it should not be left to the vagaries of sepoy.

In the artillery No. 1s of guns are Havildars for the simple reason that an inexperienced and irresponsible individual will not only cause financial loss but also may endanger the lives of troops on his own side. In the case of a 3-inch mortar section consisting of two mortars we have a Havildar as Section Commander, 1 Naik for each mortar and a Captain as Platoon Commander, while a JCO as 2 i/c is authorised in the Platoon Headquarters controlling three 3-inch mortar sections.

There are two solutions to the problem:—

(a) **Immediate solution**

One of the 3 Naiks authorised in the Infantry Platoon can be put in charge of a 2-inch Mortar Section, and a rifle section can be commanded by a L/Naik. 2 Sepoys can be posted from the other rifle sections whose strength will naturally be

reduced correspondingly. The 2-inch mortar team can be called a section so as to have the same status as the 3 rifle sections in the Platoon instead of being a detachment. This remedy can be put into effect by battalion commanders.

**(b) Final solution**

The necessity for the numbers required to handle 2-inch mortars efficiently should be examined by Army Headquarters and the requisite manpower included in the permanent establishment.

If this organisation is adopted it will not only make the 2-inch mortar section efficient and more effective but will also have a wholesome effect on the platoon from the training and fighting points of view. The NCO in charge of the section will naturally specialise in this weapon and can be used for disseminating the knowledge within the platoon. The 2-inch mortar efficiently handled will make the infantry platoon more independent of 3-inch mortars and artillery fire at close ranges than is the case at present. It will also result in saving money which is being wasted through inefficient handling of the weapon.

Finally, if I have convinced the junior officers of the necessity of attending to small things I feel I have achieved more than I set out for. There is no dearth of small problems.

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## SCIENTIFIC SELECTION IN THE SERVICES

### HOW IT EVOLVED IN INDIA

CAPTAIN S. C. SHARMA

SINCE the last War, an entirely new method of Selection of Officers and Other Ranks has been introduced in the Armed Forces.

This attempt to select personnel by the scientific method is now universally recognised and is considered a great step towards the goal of economic use of manpower and abolition of human wastage. It is a fair method of assessing a person's general intelligence, aptitude and qualities of personality. The old practice of selecting candidates after a short interview by a Board consisting of officers was widely recognised as unsatisfactory. In England, an interesting experiment was carried out in 1941. A Board of ten Senior Officers and the Adjutant General collectively interviewed 60 candidates, each member secretly recording his vote. In no case was a candidate unanimously accepted or rejected. This showed that any candidate might have passed or failed depending on the Senior Officer by whom he was interviewed.

#### ORIGIN

The American Army was the pioneer in providing 'Alpha Test,' which was a test of intelligence. On this rough grading, a recruit was allocated skilled or unskilled army employment. This test though crude was universally admitted to be a great success. Unfortunately the work on these projects had not commenced when the war of 1939 started. In 1939, Psychological Selection was introduced into the German Army. It made rapid progress, so much so that before the war began, there was a large number of psychological testing stations in Germany. Russia too, although full details are not available, did not remain behind in introducing some sort of psychological methods for selecting Officers and men for their Armed Forces. In England the new system of selection was already in existence, when in August 1941, it was taken out of the hands of private enterprise and a Directorate of Selection of Personnel was formed under the Adjutant General. Personnel Selection Officers and Sergeant Testers were employed to carry out Selection throughout the Armed Forces. The

chief need was to provide Junior Officers and N.C.Os. The shortage of these had in the past been most acute and had to be filled up.

### BEGINNING IN INDIA

In India before the introduction of the scientific method, selection of potential officers was done by a simple interview by Central Interview Boards (C.I.B.) These Boards were three in number and used to go round the country in order to select candidates for commissions. In the beginning of 1943 (Feb-Mar), Col Passey set up an experimental Board at Dehra Dun in which psychological tests were used for selecting officers. He had an Indian psychologist as his chief technical officer. From a historical point of view, this office of a psychologist marked the beginning of the Technical Section of the work. The work of the psychologists on the Experimental Boards consisted mainly in trying out various intelligence and personality tests and modifying them to suit the Indian intelligentsia.

Before the War, selection of officers for all three services was conducted by the Federal (now Union) Public Service Commission through a competitive examination and a personal interview. The number of officers so selected was relatively very small and hence no difficulty was experienced. But there was a real hurry during the war, in finding a large number of potential officers for the expanding Indian Army. The work of the Experimental Boards would have taken a long time to produce effective tests and methods for selecting officers, and so it was decided to bring officers and technicians from U.K. to try selection methods in India. Brig H.F. Vinden (then Col) came out to India in May-June 1943 with one psychologist—Lt Col T. Anderson (then Maj)—with U.K. tests and methods. They set up their H.Q. in Delhi for a short while. Lt Col Anderson did some testing on I.M.A. cadets (Emergency Commission) in 1943. These tests were later used at the Services Selection Boards.

Brig Vinden and others came to Meerut to set up a Selection Directorate in the second half of 1943, and Maj Anderson as D.A.A.G (Tech), filled the role of Chief Psychologist with Brig Vinden as Director. Six experienced and well qualified Indian psychologists were selected to work in S.P.3. the technical section of S.P. Dte—of whom three were civilians and the other three were commissioned in the Army. The aim of bringing these psychologists was that they should devise new tests suitable for the Indian population, and also with a view to starting Other Rank Selection in the three services. These psychologists did an enormous amount of

spade work to devise new tests which were applied on illiterate or poorly educated recruits. It is to the great credit of these psychologists that within the course of 6 to 8 months they produced a set of novel and original tests which won recognition. These tests were at a later date employed by other countries such as Burma and Egypt and U.K.

#### OFFICERS' SELECTION

Selection Boards started from humble beginnings. In early 1943 with the disbandment of the Central Interview Boards, the work of selecting officers for the Armed Forces was entrusted to Selection Boards under the S. P. Dte. In 1943 there were as many as five Army Selection Boards with one Naval and one Air Force Selection Board. At one time the number of Selection Boards had risen to eleven. The type of work done by these Boards was testing of civilians, other ranks, J.C.Os. and E.C.Os. There was also one W.A.C. (I) Board for testing girls for Officers' ranks.

A Selection Board consisted of:—

1. A President.
2. A Deputy President.
3. A number of Group Testing Officers.
4. A Psychologist assisted by a number of Printer Writers (now called Asstt. Psychologists).
5. A Psychiatrist—now withdrawn from S.S.Bs.

The President and the Deputy President assessed the suitability of a candidate through the medium of personal interview which formed an essential part of the "Interview technique". It provided factual information and aspects of personality which neither the written nor the G.T.O. Tests might have revealed.

The Psychologist administered to the candidates a series of tests which were employed in the assessment of the candidate's personality and officer potentialities. No candidate was normally selected by the Board whose intelligence was lower than the average of the men he was to command. However, intelligence was not the only factor leading to acceptance. Personality was one of the most important factors for consideration.

The tests administered by the Group Testing Officer were known as G.T.O. Tests. In these the basic features of personality were revealed under compulsory conditions. The problems were designed to demand commonsense rather than military skill.



The Psychiatrist on the Board also interviewed candidates and set out to assess the essential soundness of a man's nature paying attention to his past history. He took a comprehensive view and used his experience to indicate to the Board likely developments of character.

#### OTHER RANK SELECTION

Towards the end of 1943, it was decided to examine the possibility of testing Other Ranks—Recruits. It was agreed in November that an effort should be made to launch the first experimental testing of Other Ranks in January 1944. A separate section within the S.P. Dte was formed for this purpose. The policy decided upon by the Technical Section for the experimental testing was to concentrate in the first instance upon the testing of intelligence and to select tests or construct new tests which would measure general intellectual ability.

At the time of initial experiments JCOs were employed as "Testers" to administer these "ORs' Intelligence Tests". They replaced the British Sergeant Testers. During the period from August 1944 up to the middle of 1945 the O.R. selection in the Army, Navy and the Air Force was in full swing. A number of O.R. tests were constructed and quite a large number of ORs were put through these tests. Three Personnel Selection Teams were sent to Recruit Reception Camps (Jullundur, Lucknow and Bangalore) to test the new entry recruits. By the end of April 1946, it was decided to train about 400 unit Personnel Selection Officers for the N.C.O. promotion scheme which was introduced at the instance of Field-Marshal Auchinleck.

The field of O.R. selection was not confined to the Army. The Navy and the Air Force also adopted this system to select their Ratings and Airmen. The service done to these arms by Personnel Selection Teams was recognised by Naval HQ and Air HQ. Both these services decided to continue the application of Selection procedure among their Other Ranks in peace time.

#### S.P. TRAINING SCHOOL

With the introduction of Officer Selection and Other Rank Selection in the three services the need for Selection Officers and Testers was multiplied. It became necessary to have a central place of training for maintenance of test standards and assisting in test development and research work in the Dte. This provided facilities for demonstration of "Tests and Selection Procedure" to visitors,

## REORGANISATION AFTER THE WAR

On the cessation of World War II, the Army was faced with the problem of reduction and thereupon of demobilization. New intake into the Army was stopped. The selection of Other Ranks in the Indian Army was curtailed to a great extent. The Personnel Selection Teams working at the three Recruit Reception Camps (Jullundur, Lucknow and Bangalore) were recalled to the Dte. and disbanded in August 1945, after functioning for about five months. The demand for potential officers for the Army also became less urgent. Hence Personnel Selection Comb-out Teams were also disbanded. The Officers (P.S.Os.) and J.C.Os. (Testers) employed for O.R. selection and P.S. Officers' 'Comb-out' Teams were posted away to their respective units. This marked the closing down of Other Ranks selection in S.P. Dte. In 1945 Emergency Commissions were stopped and the Boards switched over to testing I.E.C.Os. for Permanent Regular Commissions and Short Service Regular Commissions and young civilians for I.M.A. courses for the grant of Regular Commissions, testing of State Forces candidates etc.

With commitments much larger than they had ever been during the war years, the reduction programme introduced a vast problem which had to be faced. At the same time a number of other plans were creeping up and the formation of a Pre-Cadet Training Centre and a Pre-Selection Training Centre was envisaged. To carry out the research work, teams were sent out to various units of the Army. They also visited various Schools and Colleges throughout the country and obtained some data on which further research on tests was made by the Psychologists. The Pre-Cadet Training Scheme was dropped altogether and the Pre-Selection Training Scheme was considerably changed both in size and scope. This was known as P.S.O.T.S. YOL. It was entirely controlled by the S.P. Dte. and commenced functioning on 12 May 1947 and closed down in July 1947. It reviewed the cases of approximately 2400 I.E.C.Os. who had been placed in grades six and seven by S.S.Bs.

## PARTITION AND AFTER

Consequent on the partition of the country and of the Armed Forces thereof, a good deal of time was taken up by the duplication of documents required by the Pakistan H.Q. After Partition the Union of India established three Service Selection Boards for the Army—at Bangalore, Bareilly and Meerut, and one for the R.I.A.F. at Dehra Dun. In early 1948 the R.I.A.F. Selection Board came under the direct control of Air H.Q. and ceased to function under the S.P. Dte.

In 1948 the need was felt to fill in the gap in the officers' ranks, which had been caused by Partition. A.S.S.B. at Lucknow was established in August 1948. To grant Temporary Commissions, three Temp. Commission Selection Boards were established at Bangalore, Bareilly and Meerut. These were disbanded in April 1949, after functioning for six months. A Naval Board for selection of officers for the Indian Navy was established in Meerut in November 1948. A number of civil departments of the Government, such as P. & T., U.P.S.C., as well as private firms have, from time to time, sought help to select skilled and unskilled persons through this new method of putting the right man in the right job.

In 1949, a Committee was appointed by the Government of India to recommend suggestions for improvement of Selection of Officers for the Armed Forces. They recommended the creation of a Psychological Research Wing, under the Defence Science Organisation which had been formed the same year in the Ministry of Defence.

The following major changes were brought into effect :—

1. All candidates were required to qualify in a written half-yearly examination to be conducted by U.P.S.C. before appearing at a S.S.B.
2. The results of the U.P.S.C. examination and the Services Selection Board tests were to be combined.
3. The Selection Boards were to award marks instead of grades and each member of the Board had a certain number of marks allotted to him.
4. The post of the Psychiatrist on the S.S.B. was abolished, but two well qualified Psychiatrists were appointed at the Psychological Research Wing.

Two Selection Centres were created—one in the North at Meerut and the other in the South at Bangalore. The Selection Boards now are 3 for the Army and Navy and one for the Air Force.

Since the creation of P.R.W. a number of changes in the procedure of selection of officers and other ranks and in the tests have been made and have been tried at the S.S.Bs., with great success. The S.P. Directorate on its recent abolition became a branch of the Organisation Directorate and is functioning efficiently in conjunction with the P.R.W. Numerous Scientific experiments are being carried out in the S.S.Bs. with a view to putting Selection on the most up-to-date and advanced lines.

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## A WITHERED BELDAME NOW

### PORTRAIT OF A SETTLEMENT

'KRGm'

**B**ALASORE in Orissa is today as colourless as she is unknown. Her vicissitudinous past, however, is not lacking in interest.

Through the pages of her history march the Afghans, the imperial Moghuls, the depredating Marathas and the European aspirants to holding the East in fee—the Portuguese, the Danes, the Dutch, the French and the English. Lying on the highway along which armies passed and repassed, she was ravished and rehabilitated in turn, time and again.

To the Defence Services, Balasore is, of course, synonymous with the proof and experimental establishment founded there in 1896, of which more anon.

The name Balasore is said to be a corruption of Baleswar—the young Krishna, or of Baneswar or Banasura, a forest demon of the locality whose chief claim to fame is that he had a very pretty daughter with whom Krishna's son Pradyumna tried to elope. Early English documents refer to the place as Bollasorye. Several ribald versions of the name, which the fecundity of the British soldiers' minds could devise, exist but are known only to a dwindling esoteric circle of ancient proof officers.

The early history of Balasore is merged in that of Orissa which formed part of Kalinga before its conquest by Asoka followed by the Mauryas and others. In 1205 came the first Moslem incursion by Muhammed-i-Shiran, an officer of Bakhtiyar Khilji. Followed a period of fighting between the Afghans and the Moghuls.

In 1598 Shujat Khan entered Orissa as a conqueror and finally annexed it as a Moghul province and it remained so till 1751 when it was wrested by the Marathas.

Orissa experienced the deepest misery under the Maratha yoke and to this day the Oriya term for anarchy and oppression is *Maratha Amal*. Maratha horsemen scoured the countryside at stated intervals pillaging it

in the name of revenue-collection. Within seven years two terrible famines stalked the land and hundreds of thousands perished on every roadside. It is not surprising, therefore, that when the English appeared in 1803 as conquerors, the Marathas were left unsupported by the people.

The main historical interest of Balasore lies in the fact that it contained some of the earliest European settlements in the Bengal of those days. Of the earliest the Portuguese settlement (circa 1599) no vestige remains at all.

From early records it appears that the Dutch acquired a plot of land at Balasore still known as *Hollandais Shahi* or *Ulan Shahi* in 1645. It lingered on for nearly two centuries and was ceded to the British in 1825. All that remains is a brick pyramid erected in memory of Van Sevenhuisen the tablet on which reads:

MICHELLELIANS  
BURGRAAF  
VAN SEVEN  
HUISENOBIIT  
23 NOVEMBER  
1696

and another headstone which reads:

NBELLA 8Y JLIA

The Danish settlement established circa 1676 and still known as the *Dināmārdānga* was ceded to the British in 1846.

The French settlement which is on the outskirts of the town called to this day, *Farāshdānga*, remained zealously under the Administrator of Chandernagore till recent times when the French possessions in India were transferred to the Republic.

About the founding of the English settlement at Balasore, the following is an interesting excerpt from Hunter's History of India:

"In March 1633, eight Englishmen started in a native junk, 'with a square sail, an oar-like rudder, and a high poop, with a thatched house built for a cabin', and rolled up the Bay of Bengal till they reached the mouths of the Great River of Orissa [the Burrabalang]. There, on April 21, Easter Day, 1633, they cast anchor inside the mud-banks of the Mughal Customs-Station at Harishpur. The Hindu Port-Officer or "Rogger" (our sea-captain's rendering of Raja) behaved with Indian courtesy to strangers.

But presently a Portuguese frigate steered into the haven, anchored close to our half-decked boat and got up a scuffle on shore, 'where our men being oprest by multitudes had, like to have been all slaine or spoyled, but that Luckslip the Rogger (*i.e.* Lakshmi the Raja) rescued them with two hundred men.'

"Ralph Cartwright, the chief merchant, leaving the boat in the joint protection of its crew and the friendly Port-Officer, proceeded with a small deputation inland to the Muslim Governor of Orissa at Cuttack....The kindness which they met with on their few days' journey up the delta—kindness which Hindu hospitality showed to any stranger from a distant land who came in peace—impressed them deeply. The imposing etiquette of the Court of Cuttack quickly brought them back to a sense of their position.....[The Moslem Governor of Orissa] received the three Englishmen in his Hall of Public Audience amid oriental splendour; affably inclined his head to Mr. Cartwright; then slipping off his sandal offered 'his foot to our merchant to kiss, which he twice refused to do, but at last he was fain to do it'. Cartwright presented his gifts. Before, however, he could finish his petition for trade, 'the King's almoner' gave the signal for prayer, the glittering Court knelt down with their faces to the setting sun and business ended for the day....

"Cartwright came with two distinct objects: redress for the Portuguese attack within a Mughal harbour, and a license for trade. The Portuguese Captain lodged a counter-complaint against our crew, and each of the litigants purchased the aid of powerful officials....The Governor 'made short work with the matter, and put us all out of strife presently; for he confiscated both the vessel and goods all to himself'. This was too much for the English temper. To the astonishment of the courtiers 'our merchant rose up in great anger, and departed, saying that if he could not have right here, he would have it in another place'.....

The Governor, rather amused than offended by his audacity gave him three days to cool down, and then ordered him into his Presence....The result soon appeared. The Governor or 'King' kept the Portuguese frigate, but on May 5, 1633, he sealed an order giving the English an ample license to trade....Next month, June 1633, Cartwright founded the factory at Balasore".

The Portuguese had, however, established themselves in the district some time before the English appeared there, as early as 1599 at Pipili.

It was a centre of the Arakanese pirates with whom the Portuguese were in league to cripple the English trade. Their sloops used to haunt the Bay, harry English shipping and carry off the men to Pipili which was a great slave-market whereto the Arakanese pirates also brought their prisoners. The Portuguese had solemnly undertaken to keep the Bay clear of pirates, but shamefully neglecting their promise paved the way for their own downfall. Shah Jehan, enraged at their piratical raids and their refusal to release the numerous slaves in their service, determined to teach them a lesson. In 1632 he besieged and took their settlement at Hooghly, enslaved or circumcised the male survivors and sent their fairest maidens to Imperial harems, in the best traditions of the prevailing Moslem custom.

Their stay in Balasore had not been one of commercial prosperity to the English and twice they very nearly abandoned it. The luscious fruits and the cheap arrack of Orissa were irresistible to the sailors and malaria decimated them.

By 1686, the fortunes of the English in Bengal were at the lowest ebb. They were harassed by Shaista Khan, the Viceroy, and driven out of Hooghly. Headed by Job Charnock, they took refuge in the swamps of Sutanuti on the present site of Calcutta even which they had to abandon and move in 1687 to Hijili. Charnock now decided on some reprisals and the first blow was struck by the ships at Balasore. The English captured the fort in a single night with small loss. On the following day they took the new town burning and destroying all before them. They broke into the king's custom-house, they plundered the private merchants and burnt all the shipping as it lay in the docks. Two hostile vessels which arrived with re-inforcements and four elephants were seized. The sack of Balasore was repeated in 1688 by the English led by Heath, a hot-headed swashbuckler. She remained unoccupied by the English for some years after this till 1690 when Aurangzeb granted them a new *firman*.

There were frequent alarms and excursions by the piratical Portuguese and the competing French. In 1799 a very gallant action was fought in Balasore Roads by the British frigate *La Sybille* against the French frigate *La Forte* which was reputed to be the most heavily armed vessel afloat of her times. After a fierce exchange in which *La Forte* lost an admiral, her captain and all her lieutenants and sustained a casualty of 140 out of a crew of 300, the French vessel struck her colours. *La Sybille* carried her prize off in triumph into the Hooghly with only 15 casualties,

amongst whom was her commander Capt. Edward Cook, RN, to whose memory a monument was erected in Westminster Abbey.

The Maratha raids soon began to cause desolation to the country and injure their trade.

In 1803, matters came to such a head that a force of about 1000 men had to set sail from Calcutta. They landed at Jampada near old Balasore. They advanced along the river but were not opposed by the Maratha horse till they were close to Baliaghat. Here there was a short skirmish with them and the British rushing forward attacked and took the fort on 21st September 1803.

Thus Balasore passed to the British, the flag following the trade; and today she is indistinguishable from the thousands of similar District Headquarters towns sprinkled all over India.

The establishment of an artillery Proof and Experimental range at Chandipore, 9 miles from Balasore, has been adverted to earlier. In 1893 some 10-inch shells manufactured at Cossipore (near Calcutta) had to be sent to England as no proof facilities were available in India. Hence the Government of India felt the need for a proof range in the Country. The Director General of the Ordnance of that time tried to get a suitable location near Calcutta, but as the mud of the river would render the recovery of the projectile (in "over-water" shoots) impossible, a site further afield was sought for. Finally, thanks to the suggestions of the Port Officers of Calcutta and Orissa, Chandipore was inspected and reported upon. On this coast the five-fathom line is about 12 miles from the shore and a beach of 2 to 4 miles width is uncovered at low water. So favourable was the report that Government of India in their letter No. 68 of 20th March 1895, put forward definite proposals to the Secretary of State for the establishment of a proof department, with H.Q. at Balasore. They were accepted and the Establishment came into being as a result, in 1896.

Communications were difficult in those early days before the Bengal Nagpur Railway's line from Calcutta to Madras was constructed. There were two routes from Calcutta—one by sea by steamer and the other by the Orissa Coast Canal by launch. For this latter route a steam launch 'Balasore' was commissioned and stores from Cossipore were brought to a jetty within a mile of Chandipore whence they were transported to the range by a light tramway of which only the embankment exists today.



The journey of the first proof officer—Capt. R.T. Moore R.A.—with his wife and child to Chandipore was fraught with hazards and difficulties. The party travelled by sea from Calcutta and alighted at a place three miles from Balasore where they transhipped into the 'S.L. Balasore' and so up the river and canal to the *ghat*. Due to floods, the road between this point and Chandipore became impassable even for the Carts, bullock, Mark 1. For a few days they were marooned at the *ghat*. Finally they arrived at Chandipore where a bungalow purchased from the local Catholic Mission was ready to receive the Officer and his family. The remainder had to rough it out under canvas.

Balasore was selected as more suitable for the residence of the officers than Chandipore and in the early days the staff made their way to the proof range and back on horseback for which a horse allowance of thirty rupees was sanctioned.

For many years there was no bridge over the Orissa Canal and a ferry operated on the Balasore-Chandipore route. Later on a drawbridge was constructed which stands to this day but is shortly to be replaced by a more modern and immobile structure, now that the Canal has lost all its importance as a highway of commerce. The ferry crossing, of the pre-bridge days, especially in the rains was not free from risks and on one occasion "the proof officers' motor car and a *gari* containing Mr. Wheeler's kit, each separately and independently were deposited into the slimy bed of the canal", wherefrom Mr. Wheeler's kit remains still unretrieved.

The range was infested by tigers which the Proof Officer used to shoot from the observation platform; but they, taking umbrage at the bang of the guns soon retreated into the more congenial atmosphere of the Nil-giri forests nearby. Another source of danger the reptilia—cobras, kraits, vipers—are still in residence in large numbers.

In a recent letter a retired Superintendent of Proof and Experiments of 1932 vintage writes: "I found living at Chandipore rather frightening. It swarmed with snakes and I cut and burnt the undergrowth there. In the small meadow the coolies collected the dead snakes in heaps". The menace continues to this day aided by the countless rat holes that the coast is riddled with. In another letter he adds: "By the way have you noticed that Chandipore cobras are mon-ocular". To this the writer's reply is that when he sees a cobra he stands not upon the order of going; but all the dead ones inspected by him so far have been bi-

nocular. The writer has recently seen a mon-ocular cobra being displayed by a snake-charmer in Balasore town—the mon-ocular marking being lozenge-shaped like a heraldic device.

There is a phenomenon which has often been experienced at Chandipore. Occasionally one hears sounds from the sea similar to the boom of cannon. These occur even on clear cloudless days and are still inexplicable. Coming across a person steeped in Chandipore lore, the writer posed a question to which the reply was: "Don't you know; they are *the Guns of Balasore!*" Elucidation on the point was however prevented by someone barging in, changing the topic and monopolising the conversation, and the opportunity was lost for ever. There must be a thoroughly water-tight and highly scientific though prosaic explanation for the phenomenon, but the writer is happy to remain in the belief that *La Sybille* and *La Forte* and other phantoms occasionally return from Valhalla to their terrestrial hunting grounds.

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**REVIEWS****SOUTH-EAST ASIA BETWEEN TWO WORLDS**

TIBOR MENDE

*Turnstile Press, London, 21/-*

The two worlds referred to in this book are the Indian world and the Chinese world. These two mammoth countries with a combined population representing a third of the human race have almost simultaneously awakened from the slumber of alien imposition. Renascent and purposeful, brimming over with the self-confidence of the adolescent that knows no obstacles, they have embarked on a gigantic programme of economic development and national reconstruction for the building up of the "Welfare State" of prosperity and plenty for all.

Though the ultimate aim may be the same, the means and the methods employed by the two worlds differ in that India plans progress by "persuasion" whereas Red China plans her future by "compulsion". Having started on the same rung of the ladder, so to speak, the measure of their progress and accomplishment will lend itself to comparisons. Comparisons of the results will be accepted as proof of the efficacy of the methods employed. And the question that the hungry and impatient millions of South-East Asia ask is which way lies salvation and the solution of their economic evils—by surrendering themselves to the compulsion of rigid, all-embracing totalitarianism, or can they afford the luxury of political freedom and achieve progress and uplift by adherence to and adoption of democratic methods?

Between the two worlds that are thus experimenting with the future live the other millions of South-East Asia who will sooner or later choose between these two, whose rival principles are "planning by persuasion" and "planning by force". In the ultimate analysis it is a choice of Communism or Democracy to the millions that are waiting and watching.

It is of these that Tibor Mende writes in this extremely interesting and readable book. Dividing it into four parts, he devotes the first three to a study of political, social and economic conditions in Indonesia, Burma and Pakistan. It is an exciting travelogue as well as a penetrating analysis of

the ethos of the countries visited, as he takes us along this great river of humanity, so different from each other and yet strangely united by a common revulsion against dependence on the foreigner and a somewhat vague but unmistakable consciousness of a common destiny.

Is there a panacea for what ails this part of the world? How successful is the Western policy of aiding these under-developed countries, or has it been based on wrong appreciations and a lack of understanding of the real remedy? Tibor Mende's conclusions are thought-provoking in the extreme and the policy makers of the West would do well to pause and consider them with deliberation.

N.K.

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## BUGLES AND A TIGER

JOHN MASTERS

*Michael Joseph, 16/-*

Travelling in the train the other day I met a young Gorkha Officer who complained that Bakloh was a god-forsaken place. Reading John Master's book one is led to believe that it is a paradise; but then a place is made by the people, and to the author there are no better people, comrades or soldiers than the Gorkhas,\* and since Bakloh was full of Gorkhas, what more could he want? He had become one with the regiment—so much so that when at the time of partition he was given the option of serving with the British Army or retiring he chose the latter. To him there was nothing like the Indian Army or the Gorkhas.

The book is autobiographical and gives the story from the time he joined Sandhurst till the beginning of World War II, i.e., from 1933 to 1939. It is a story of change and of growth. In 1933 he disliked or despised more things and people than he loved or admired. In 1939 it was the opposite.

Very early in the book we see the young bumptious officer being brought down a peg or two and given his first lesson in loyalty. "Loyalty

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\* Masters adopts the traditional British spelling for this word, viz 'Gurkhas'.

means backing up a man even when he's in the wrong. Even if he's stupid and inefficient. That's why its so hard to be loyal."

He was taught that it was wrong to make too much noise, or make "dubious jokes with, at, or to, someone's wife", but we also read of subalterns being disturbed in their bedrooms, in an 'operation only traditionally military'! Senior officers did not look on this lightly—but when do they?

There are excellent descriptions of the life in a cantonment, social life, army routine, welfare, frontier operations, and of course, the killing of a tiger. It is not easy to put this book down unfinished.

One feels the young officer "being trained on parallel lines by the regiment"—one of the body, one of the brain, one of the character, and one of the spirit. The book is also packed with incidents and anecdotes, the spirit of the regiment (the second Bn 4th Prince of Wales' Own Gurkha Rifles) being the thread weaving all these together.

This is a book that every Gorkha officer, whether traditionally minded or not, should possess and one from which every army officer, no matter what his corps or arm, will learn a great deal.

J.A.F.D.

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## BRASSEY'S ANNUAL

### THE ARMED FORCES YEAR BOOK

EDITED BY REAR-ADMIRAL H.G. THURSFIELD

*William Clowes & Sons Ltd.*

The publication of the 1955 edition of Brassey's Annual, has placed in the hands of the Military students another volume of thought-provoking articles by distinguished service authors. The reference section of Brassey's is now a comparatively small one, including little more than the annual statement of defence, and the three service estimates in the United Kingdom. One presumes that the dictates of security prevent anything more specific or detailed from being published in this section.

The range of articles, however, covers a wide variety of subjects—from atomic and thermonuclear weapons, their strategic and tactical appli-

cation, to the many problems of defence policy which face the British Government today. The article by Dr. Brodie, on the evolution of air doctrine, goes deeply into the subject of strategic bombing. Influenced, perhaps, by the Report of the United States Strategic Bombing Survey, Dr. Brodie has exposed some well-founded doubts on the value of strategic bombing—conventional or nuclear. The volume also includes a most interesting article on Civil Defence, a subject which is fast assuming the proportions of a 'Fourth Service'.

D. K. P.

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### JANE'S FIGHTING SHIPS

*Sampson Low*

In a foreword to the latest (1955-56) edition of 'Jane's Fighting Ships' the editor has declared that Russia has continued its efforts in building up its large fleet of cruisers, destroyers and submarines. According to this publication Russia now has about 32 modern cruisers, 150 destroyers, and not less than 400 submarines. 'In addition, the Soviet Navy is capable of vast mine-laying and mine-sweeping efforts and has numerous escort and patrol vessels, motor torpedo-boats and landing craft'.

Amongst Asian countries, Japan provides perhaps the most interesting subject for review. It is not widely known that Japan has greatly expanded her Navy during the last two years. In the very near future, she will have completed building ten new frigates, to add to her existing strength of two destroyer escorts, a submarine and many minesweepers. This is an impressive list for a nation which has begun the rebuilding of her armed forces as recently as Japan has done.

D. K. P.

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### A GUIDE TO THE BIRDS OF CEYLON

G.M. HENRY

*With illustrations*

*Oxford University Press, Rs. 25/-*

The birds of Ceylon and of peninsular India are closely related. Differences where they occur are minor, to be found in certain sub-species

of some of the well-known common forms. For this reason bird-watchers not only in Ceylon but also in India will welcome this useful publication.

Over 400 species and sub-species found on the Island are identified, and nearly all of them are illustrated by the author himself, some in excellent colour reproductions and others in black-and-white drawings. The descriptions are by no means exhaustive, the object being to help identify the birds in the field, mainly through the illustrations.

The author who was on the staff of the Colombo Museum for thirty-five years brings a wealth of experience to a pleasurable task. Readers interested in the subject will recollect his illustrations in Salim Ali's *Indian Hill Birds* for the same publishers in 1949. The pictures in the present volume are even better.

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## EXPERIMENT IN EXTENSION

### THE GAON SATHI

COMPILED BY

THE EXTENSION PROJECT OF THE ALLAHABAD AGRICULTURAL INSTITUTE

*Oxford University Press, Rs. 7/-*

In recent years we have grown familiar with the words National Extension Service, NES Blocks, etc., but few of us realise the significance of the word extension in this context. In North America there are Colleges for agriculture and home economics which extend their regular teaching to farmers and their families in their fields and homes. It has developed into a two-way education beneficial to both sides. This principle of extension is also practised in Scandinavian and South American countries. In India Community Development Projects and National Extension Service are now very much in the fore-front against the back-ground of the Five Year Plan. But as yet there have been no text-books suitable for those engaged in this work. The present volume published with the assistance of the Ford Foundation is an attempt to fill this gap partially. It is based on the experience gained by members of the Allahabad Extension Project in 400 villages in Uttar Pradesh.

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## SECRETARY'S NOTES

### Lecture

On 16th March 1956 Admiral The Earl Mountbatten of Burma, KG, PC, GCSI, GCIE, GCVO, KCB, DSO, addressed members on "The Higher Direction of War."

### Library

Members returning books through the post are requested to ensure that these are properly packed so as to prevent loss or damage.

### Subscriptions

Subscriptions are payable in advance, *i.e.*, at the beginning of the financial year of the Institution which is from January to December. Members and subscribers are therefore advised to make these annual payments without waiting for reminders.

### Changes of Address

There are still many instances of members going on transfer failing to inform us of their whereabouts. It is important that members and subscribers notify any changes of address to the Secretary's Office. A printed form is given elsewhere in this issue for this purpose. Please make use of it.

### Membership

It goes without saying that all members of the USI are interested in its progress. Some have inquired if they could be helpful in any way. There is one way in which all can help, and that is by getting those eligible for membership interested. A membership form is given on the last page of the Journal. Either this or a typed proforma may be passed on to those who wish to join.

### New Members

From 1st October 1955 to 31st January 1956 the following members joined the Institution :—

ABROL, 2/Lieut. S.K., The Rajput Regiment.

AGARWAL, 2/Lieut. S.K., A.O.C.

AHLAWAT, 2/Lieut. S.S., 1 Horse.



AHUJA, 2/Lieut. V.K., Signals.  
AJIT SINGH, Major, 2 Lancers.  
AMARJIT SINGH, 2/Lieut. E.M.E.  
ANAND, 2/Lieut. B.B., Artillery.  
BAJAJ, 2/Lieut. A.S., Engineers.  
BAKSHI, Pilot Officer M.M., I.A.F.  
BALAK RAM PURI, Shri.  
BALI, Pilot Officer P.D., I.A.F.  
\*BALRAJ SINGH, Lieut., Signals.  
BALWANT SINGH, Pilot Officer, I.A.F.  
BEHL, 2/Lieut. S.K., Signals.  
BHAGAT, 2/Lieut. R.N., Artillery.  
BHATNAGAR, 2/Lieut. N.S., A.S.C.  
BYRNI, Pilot Officer H.N., I.A.F.  
CHADHA, 2/Lieut. R.P., Artillery.  
CHAND, 2/Lieut. DEI, A.O.C.  
CHANDRA, 2/Lieut. S., E.M.E.  
CHHIBBER, 2/Lieut. K.C., 7 Cavalry.  
DATTA, 2/Lieut. C.L., 1 Guard.  
DEB, 2/Lieut. J.K., A.O.C.  
D'MONTE, 2/Lieut. A.P., Artillery.  
DEO, 2/Lieut. S.M., Artillery.  
DEVASTHALI, 2/Lieut. Y.A., Signals.  
DHALL, 2/Lieut. M.M., A.O.C.  
DUTTA, 2/Lieut. S., E.M.E.  
GARGA, 2/Lieut. K.C., Signals.  
GAUR, 2/Lieut. S.K., E.M.E.  
GHOSH, 2/Lieut. J., A.S.C.  
GHOSH, 2/Lieut. P.K., The Sikh Light Infantry.  
GODE, 2/Lieut. M.R., A.S.C.  
GOPALAN, Captain V., E.M.E.  
GOSWAMI, 2/Lieut. S.C., 11 Gorkha Rifles.  
GROVER, 2/Lieut. S.K., Artillery.  
GULATI, 2/Lieut. S.K., Engineers.  
GUPTA, 2/Lieut. A.S.L., 5 Gorkha Rifles.  
GUPTA, Captain B.M., Engineers.  
GURCHARAN SINGH, 2/Lieut., A.S.C.  
HAZRA, 2/Lieut. S.K., The Maratha Light Infantry.

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\*Life Member.

HIREMATH, 2/Lieut. R., 4 Gaurds.  
HOON, 2/Lieut. H.N., 9 Horse.  
IRELAND, Pilot Officer C.P., I.A.F.  
JAIN, 2/Lieut. Ramesh, The Madras Regiment.  
JAYWANT, 2/Lieut. P.N., Artillery.  
JOGINDRA NATH LAUL, 2/Lieut., A.O.C.  
JOHN, 2/Lieut. T., Signals.  
JOSHI, 2/Lieut. R.N., The Garhwal Rifles.  
KADIAN, 2/Lieut. G.S., The Kumaon Regiment.  
KALRA, 2/Lieut. B.B., Engineers.  
KANDHARI, 2/Lieut. N.K., A.S.C.  
KAPOOR, 2/Lieut. Rajinder, The Punjab Regiment.  
\*KAPUR, Captain D.N., Artillery.  
KAPUR, 2/Lieut. S., 4 Gorkha Rifles.  
KARKARE, Pilot Officer S.R., I.A.F.  
KAUL, 2/Lieut. P.K., The Dogra Regiment.  
KHANNA, 2/Lieut. M.L., E.M.E.  
KHUSHINDER SINGH, 2/Lieut., A.S.C.  
KRISHNAMURTY, 2/Lieut. D., A.O.C.  
KUMAR, 2/Lieut. HARIVANSH, A.O.C.  
MADHOK, 2/Lieut. J.D., 8 Cavalry.  
MAHINDROO, 2/Lieut. S., 4 Horse.  
MAJUMDAR, Pilot Officer A.K., I.A.F.  
MALHOTRA, 2/Lieut. B.S., Artillery.  
MALHOTRA, 2/Lieut. K.C., Engineers.  
MALHOTRA, 2/Lieut. V.P., The Sikh Light Infantry.  
MALIK, 2/Lieut. B.S., 14 Horse.  
MALKANI, 2/Lieut. H.T., Engineers.  
MANDKE, 2/Lieut. S.R., 8 Gorkha Rifles.  
MARTIN, Pilot Officer K., I.A.F.  
MEHTA, 2/Lieut. R.K., The Sikh Light Infantry.  
MENON, Captain C.P.A., The Madras Regiment.  
MENON, Lieut. P.V.N., A.S.C.  
MOHAMMAD AHMAD ZAKI, 2/Lieut., The Maratha Light Infantry.  
MOHAN, Pilot Officer S.C., I.A.F.  
MOTWANI, 2/Lieut. H.C., E.M.E.  
MUKHERJEE, 2/Lieut. J., A.S.C.  
NARINDER NATH, 2/Lieut., Artillery.

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\* Life Member.

PADDA, 2/Lieut. S.S., The Rajput Regiment.  
PAI, Lieut. M.H., E.M.E.  
PARMINDER SINGH, 2/Lieut., The Rajputana Rifles.  
PATHAK, Pilot Officer B.V., I.A.F.  
PATI, 2/Lieut. H., 5 Gorkha Rifles.  
PATIL, Captain K.G.S., A.S.C.  
PRITHVI PAL SINGH, 2/Lieut., The Dogra Regiment.  
RAMAKRISHNAN, Lieut. N.S., A.S.C.  
RAM CHAND, Major, A.S.C.  
RAMMOHAN RAO, 2/Lieut. M.S., Artillery.  
RANGASWAMI, Shri, Ministry of Finance (Defence).  
RANGASWAMI, 2/Lieut. S., Engineers.  
RAVINDRAN, 2/Lieut. P.M., E.M.E.  
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ROY, 2/Lieut. D., Engineers.  
SAHIB SINGH, Major, A.O.C.  
SARAN, 2/Lieut. R., Signals.  
SASTRY, 2/Lieut. G.B.V.L., The Punjab Regiment.  
SEHGAL, 2/Lieut. K.K., E.M.E.  
SETHI, 2/Lieut. K.N., Artillery.  
SHAMBHUJI LAL, 2/Lieut., The Dogra Regiment.  
SHAMSHER SINGH, 2/Lieut. H., 4 Gorkha Rifles.  
SHARMA, 2/Lieut. R., 2 Lancers.  
SHARMA, 2/Lieut. S.L., Artillery.  
SHEORAN, Major, R.S.  
SHRIVASTAVA, Pilot Officer, P.N., I.A.F.  
SHROTRIA, Captain, R.C., M.C., A.S.C.  
SITA RAM, Captain, A.O.C.  
SODHI, Lieut. Commander S.S., I.N.  
SOOD, Pilot Officer, R.K., I.A.F.  
SOOD, 2/Lieut. S.B.N., Engineers.  
STUART, Lieut-Commander, C.G., I.N.  
TANEJA, 2/Lieut. K.C., Engineers.  
THYAGARAJAN, 2/Lieut. A., A.S.C.  
\*TYAGARAJAN, Captain, K.  
URS, Captain, G.M., E.M.E.  
VASUDEVA, Commander, P., I.N.  
VERMA, 2/Lieut. G.R., Artillery.

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\* Life Member.

VINOD KUMAR SINGH, 2/Lieut., The Madras Regiment.  
YASHWANT DEVA, 2/Lieut., Signals.

#### SUBSCRIBING MEMBERS

Three Officers' Messes and Units were enrolled as subscribing members during this period.

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#### GOLD MEDAL PRIZE ESSAY COMPETITION, 1956

The subject is:—

**“A truly national army recruited without reference to areas, regions and classes can be a great instrument to secure cohesion. In all multi-lingual countries the armed forces have always been a precious crucible for the transmutation of provincialism into an integral nationalism”**

*Geographical Factors in Indian History,*  
by K.M. Panikkar (Page 91)

**Discuss the validity of this statement with special reference to the armed forces in India.**

Entries in triplicate should reach the Secretary, United Service Institution of India, by 31st July 1956.

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# TO ADVERTISERS

## **U.S.I. JOURNAL**

(ESTD. 1870)

### **IS AN EXCELLENT MEDIUM FOR GOOD CLASS ADVERTISEMENTS**

- It is a Journal with a tradition of quality extending back over eighty-five years. Advertisements which are accepted will therefore bear the hall-mark of this quality.
- It is read by officers of the Army, Navy and Air Force as well as Civilian Officers. Its reader circle thus represents a class of people with a certain standard of living and steady purchasing power.
- It circulates in India, Pakistan, Ceylon, Burma, Malaya, Australia, New Zealand, Tasmania, South Africa, British East Africa, the United Kingdom, Canada, the U.S.A. and on the continent of Europe. All advertisements will therefore reach most countries of the world.

Rates on application to the Secretary

**United Service Institution of India**

KASHMIR HOUSE, NEW DELHI

# The Journal of the United Service Institution of India

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Vol. LXXXVI

APRIL-JUNE

1956

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*The views expressed in this Journal are in no sense official, and the opinions of contributors in their published articles are not necessarily those of the Council of the Institution*

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## EDITORIAL NOTES

### **NATO Arms and Organisation**

In May 1956, President Eisenhower announced to Congress that the United States Government were planning to provide all the member nations of N.A.T.O. with atomic weapons. U.S. Forces in Europe are at present equipped with such atomic weapons as 'Nike', 'Corporal', 'Honest John' and 'Matador' missiles and 288 mm gun battalions. Although all of these will not necessarily be introduced as standard equipment, certain types which are under mass production in America (probably the 288 mm guns, and 'Honest Johns') will be issued to all the member forces. It is also possible that F-100 Super Sabre fighters, which have replaced the F-86 Sabre jets in the U.S. Air Forces, will also be released in increasing numbers for other member nations.

The War Office has now announced its plans for large-scale reorganisation of the British forces in Germany. The present contingent—one infantry and three armoured divisions—is being reorganised into two new pattern infantry divisions and two trial pattern armoured divisions. The new type of infantry divisions will consist of three brigade

groups, each with its own allotment of armour and artillery, which will be able to fight independently. The extra troops for the second infantry division will be found from the armoured divisions, which are being shorn of their infantry to make them more mobile. The armoured elements for the infantry brigades will presumably be found by disbanding one of the armoured divisions.

There are many who have questioned the advisability of taking the infantry element away from armoured divisions; and of de-centralising the support elements in the infantry division. The main reason for these drastic reorganisation measures is to enable smaller 'combat teams'—armoured or infantry—to operate self-contained on the atomic battlefield, without the encumbrance of long administrative tails. It is in effect a compromise between tactical requirement and logistical practicability.

### **Advisers for the New West German Army**

It is interesting to learn that the Defence Committee of the West German Bundestag has appointed as its advisers Field-Marshal von Manstein, General Halder and other senior officers who served Hitler. The main problem upon which their advice will be sought is whether to introduce conscription in West Germany, or whether the new army should be a professional one. Chancellor Adenauer's Christian Democrat Party, on the whole, favours the rebuilding of Germany's military strength on a conscription basis; the Social Democrats of the opposition, however, are strongly in favour of a professional army.

On the whole, the arguments in favour of a professional army, or one with a strong professional cadre, appear to have won the day; and hence the appointment of two outstanding professionals of the Junker class as advisers. There is a new confidence in the country that after the recent amendments to the constitution, the army has (for the first time in German history) been subordinated to parliamentary control. Once this has been achieved, most factors of strategy and policy appear to favour the formation of a professional or near-professional army in keeping with its future role in N.A.T.O. plans.

## **Nuclear Defence in Britain**

The Minister of Defence announced in Parliament earlier this year the Government's plans for future civil defence measures in the United Kingdom. The dreadful consequences of nuclear attack, particularly on a highly concentrated target such as Greater London or the industrial centres of Britain, will necessitate large-scale evacuation of the civil population. It has been estimated that some twelve million people—mothers, young children, the old and infirm—will require to be evacuated from various parts of Britain. Places will take perhaps months to work out, but action to formulate evacuation schemes has already been started.

One of the historic branches of British home defence, the coast artillery, has been abolished. It has been decided by the War Office that under nuclear war conditions, the threat to British ports can best be countered by the Navy and the Air Force; and that the usefulness of the Coastal Artillery (whose history goes back more than a hundred and fifty years to the time of Napoleon's invasion threat) has now passed.

## **Russian Disarmament**

Following the unfruitful negotiations in the U.N. Disarmament Sub-Committee, Russia has declared her intention to carry out a unilateral disarmament programme. In a letter to President Eisenhower, Mr. Bulganin, the Soviet Prime Minister, has announced the intention of the Soviet Government to cut the Soviet armed forces by 1,200,000 men. Together with the previous decision to cut down the strength by 640,000 men announced last year, this makes a total intended reduction of nearly two million men. The reduction envisages the demobilisation of 63 divisions, a number of separate brigades, three aircraft divisions, and other units including 30,000 Soviet forces at present stationed in East Germany. In addition, 375 ships of the Soviet Navy are to be put into reserve.

Marshal Bulganin has stated that the Soviet Government have taken this step in an attempt to make a new approach to the solution of the disarmament problem. He also felt that the execution of these measures would undoubtedly



contribute to the "lessening of international tension, and to strengthening of mutual trust among the nations."

How far these hopes will be fulfilled remains to be seen. The first reaction in the United States has been one of doubt. It has been stated that in the absence of any agreement on inspection teams, there can be no means of checking whether the Russians do in fact adhere to their disarmament programme. Even if the actual reduction is carried out, American opinion hastens to disabuse those who accept these proposals at their face value, by pointing out that the reductions would merely be a part of the normal process of streamlining the Soviet armed forces in conformity with the requirements of nuclear war—an adaptation of the 'New Look' on the Western pattern.

Apparently, a cessation of nuclear preparations on either side will be the next logical step to induce a real spirit of disarmament.

### **Integration of U.S. Armed Services**

The possibility of future integration of the three fighting services into one "Armed Force" was first raised by Field-Marshal Montgomery in his address to the Royal United Service Institution in London, in October, 1955. When Earl Mountbatten addressed the U.S.I. earlier this year, he was questioned upon this subject, his answer though non-committal indicated that the Ministry of Defence in the United Kingdom had not as yet seriously considered the problem.

It was all the more surprising therefore to learn that President Eisenhower had ordered his White House staff planners to start working on an integration plan for the four armed services—the Army, the Navy, the Marines and the Air Force. Details have not been divulged, but it is understood that should Mr. Eisenhower be re-elected he intends to present his reunification proposals to Congress in 1957. It is likely that the new integrated service—the Armed Forces, United States—would be constituted under one Defence Secretary, one Chief of Staff, one combined headquarters. All officers and men would wear one type of uniform, be

trained at joint institutions and academies, and be on one promotion roll.

How far this idea can be made practicable can only be judged after the White House planners have provided the details.

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*Two copies are required of all articles sent to the Editor. These should be typewritten with double-spacing, and on one side of the paper.*

## THE FOUNDATIONS OF NATIONAL DEFENCE IN INDIA\*

MAJOR M. R. P. VARMA

*"No one can guarantee success  
in war, but only deserve it."*

*Sir Winston Churchill.*

### INTRODUCTION

**I**N EIGHT years of Independence, the country has made steady progress. There are many reasons for this but as far as actual government is concerned, it is attributable to the pattern of administration handed on to us and since embodied in our Constitution and other rules for the conduct of Government business. In 1947 we could claim fairly wide experience of administration. We had civil servants of sound reputation and a cadre of military officers, many with war experience and some with nearly thirty years of service. In the major professions there were eminent scholars, lawyers and doctors. Similar proficiency could be claimed in many of the other diverse public and private occupations that characterise modern life. However, in certain spheres of Government, Independence entailed a total departure from previous policies. As far as the defence of the country was concerned, National Defence was a concept that arose only with Independence and for this the previous strategy of Imperial Defence provided little guide. At that time, we had Armed Forces of excellent tradition but most of their arms, ammunition, and equipment had to be imported, while units and formations were disorganised by Partition. Knowledge and experience of higher defence organisation and control were lacking not only within the Services themselves but in the Cabinet, Ministers and Parliament. There followed a series of economic and military emer-

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\* This essay was awarded the second prize in the USI Gold Medal Essay Competition for 1955 (Ed.)

gencies which demanded exclusive attention and taxed the strength of the country to the full. It is only during the past two or three years that conditions have stabilised sufficiently for Government to be able to plan on a long term basis.

#### PRELIMINARY CONSIDERATIONS

A common feature of political organisations throughout history, irrespective of their type, is the responsibility of the state for defence. No country has ever been able to preclude the possibility of being attacked and the maintenance of a suitable degree of defence preparedness has always been a primary duty of the state. The nature of modern war makes this duty extremely difficult to carry out. It entails not only armies, air forces and naval fleets but also, what are equally important, thousands of factories, millions of technicians and workers, a Civil Defence organisation to protect them and machinery of government to co-ordinate all their efforts. In fact we talk of 'the nation at war' and total war.\* Modern war is democratic in one sense, if no other, in that it involves the entire population. Thermonuclear weapons have not changed war; if widely used, they would obviously increase its totality.

What National Defence problems should we envisage? From Government's conduct of international affairs, the doctrine of the Panch Shila and the role given to the Armed Forces it is abundantly clear that India eschews the use of military force as a political instrument. However, it is equally clear that we would protect our people, territory and principles by force of arms in the face of wanton aggression. Any country that was bent on attacking us would be able to gain surprise for, in our determination to avoid adding to local or world tension, we maintain minimum Armed Forces. It is sometimes asserted that India does not need plans for war mobilisation as our enemy would be either relatively weaker or we would be acting in conjunction with a powerful ally. But even a relatively weak country might attack suddenly with the aim of dealing a knock out blow in the first round, in the Pearl Harbour or Blitzkrieg tradition. If we were allied to a major power in a world war, India would not be a main theatre, at

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\* See *Conduct of War*, War Office, HMSO, 1951.

least not initially.\* It is more likely that we would be left to our own devices and, in the absence of adequate war mobilisation plans we might well end up in a predicament similar to Australia's in World War II following the fall of Singapore.\* Furthermore, it would be incongruous for a nation of our size and potential to be content with anything less than that our Armed Forces be supplied with all their war needs from within our own manufacturing resources. This war material must be sufficiently superior in quality and quantity to outmatch the resources of our opponents; it must also be made available at the time and place required.

The course of any war is unpredictable and to be deserving of ultimate victory a nation must wage war with singleness of purpose, avoiding all unnecessary risks and placing in support of its Armed Forces the full weight of the country's industrial strength and manpower. The transition onto a war footing must be done as smoothly and as quickly as possible. It requires comprehensive planning in peace time to ensure efficient co-ordination and the ready co-operation—under the stress and strain of a war emergency—of thousands of officials, hundreds of private firms and the representatives of the Armed Forces.

#### NATIONAL DEFENCE ORGANISATION IN OTHER COUNTRIES

##### *General*

Although National Defence problems are intimate and peculiar to each country, the broad constitutional, military and administrative problems posed tend to be the same in states of similar political organisation. The United States and the United Kingdom are two countries whose National Defence organisations deserve our examination. Both are democracies whose organisations for National Defence are well evolved; the disparity between their states of economic development and ours is, of course, considerable but it is the aim of our Government to reduce this gap as rapidly as possible—in the mean-

\* The reasons for this are geographical and strategical. It is beyond the scope of this essay to develop the argument.

\* See Churchill, Sir Winston S, *World War II*, Volume IV, Chapter IX, pages 136-46.

time, our international commitments, especially in the event of war, are far less. The Union of Soviet Socialist Republics and China have precepts and practices of government the adoption of which in our country would involve radical changes in our Constitution; thus a basis for full comparison does not exist. Canada and Australia, being Commonwealth countries, suggest congruence with India; in fact, both have entirely different strategic orientations. Other countries are at an even earlier stage of evolution than India in matters of National Defence.

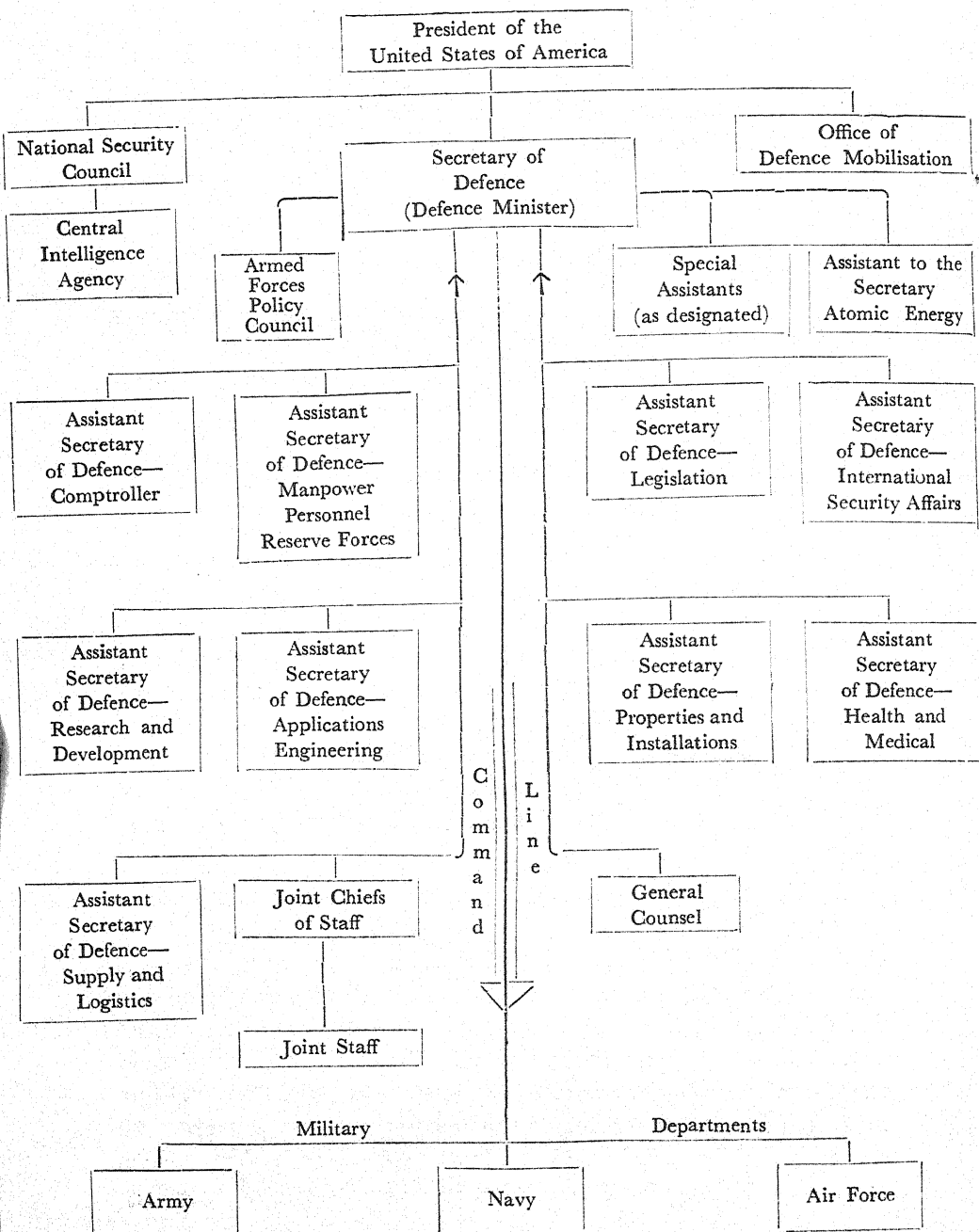
#### *The United States of America*

There are fundamental differences between our form of parliamentary democracy and American democracy. The concentration of power in the person of the President, elected every four years, and his selection of a Cabinet, whose members are not necessarily elected representatives of the people, give monolithic features to American Government and deny the principle of Collective Cabinet Responsibility.

The President of the United States is the Commander-in-Chief of the Armed Forces and, as such, is responsible for final decisions on matters of military policy. In our country, this power of decision is vested in the Defence Committee of the Cabinet, or even the full Cabinet, over both of which the Prime Minister would preside if a fundamental issue of military policy was involved. The President of India is the constitutional Commander-in-Chief of our Armed Forces; this is largely titular as in the case of the British Monarch for the rest of the Commonwealth.

Chart I shows the United States organisation for National Defence. The position of the President has already been explained. The chief advisory bodies to the President are the National Security Council, the Central Intelligence Agency and the Office of Defence Mobilisation. We have no equivalent organisations to these three bodies. They do not form part of the American Department of Defence; their policy making members cannot be serving military personnel, nor serving civil servants; they have wide powers of consultation which frequently include the Joint Chiefs of staff. When an American

## UNITED STATES ORGANISATION FOR NATIONAL SECURITY



talks of the need to retain civilian control of the Armed Forces he means at this, the highest level ; in our country this is sometimes confused with the continuance of our Ministry of Defence in its present form, staffed entirely by civil servants.

The National Security Council advises the President on matters of foreign, domestic and military policies relating to National Security. The deliberations of the National Security Council, after acceptance by the President and the Senate, may be compared to the Minutes of the Defence Committee of the Cabinet.

The Central Intelligence Agency is self-explanatory. A similar organisation to cover the requirements of the Ministry of External Affairs, the three Service Headquarters, the Home Ministry and other departments has been proposed in India and is long overdue.

The Office of Defence Mobilisation balances the total resources of the United States against the total civil and military requirements. It is a key agency in ensuring a proper degree of military preparedness.

The broad functions of the American Department of Defence can be seen from Chart I ; some noteworthy differences in comparison to India are given below. The three Service Chiefs of Staff, both individually as the head of their respective Service and collectively as the Joint Chiefs of Staff, report direct to their Defence Minister (called the Secretary of Defence in America but not to be confused with our Defence Secretary, a civil servant). The American Department of Defence is a co-ordinating and consultative body. There is a separate office of Budget in the American Government but once appropriations have been passed by the Senate, detailed financial control is integrated within each department including Service departments. Scrutiny is provided by audit and the equivalent of our Public Accounts Committee. By comparison our Defence expenditure is overcontrolled.

The Joint Chiefs of Staff is the principal strategic planning body. Its Chairman is a regular officer of the Armed Forces



appointed by the President from any one of the three fighting Services. His tenure is two years. In peace he may be appointed once; in war there is no limitation to the number of re-appointments. The consent of the Senate is required for appointment as well as re-appointment. The Chairman takes precedence over all other officers of the three Services but he is not a Chief of Staff or Supreme Commander of the Armed Forces; he cannot exercise military command. The other members of the American Joint Chiefs of Staff are the three Service Chiefs. The Joint Chiefs of Staff neither vote nor decide; they make recommendations direct to their Defence Minister and also to the President. They suggest policies, separately or through the Armed Forces Policy Council (equivalent to our Defence Minister's Committees), calculated to preserve the military security of the United States. A joint staff of approximately 210, in equal numbers from each Service, provides a permanent secretariat and planning instrument. Our own Chiefs of Staff have no secretariat of their own; they depend on the Cabinet Secretariat (Military Wing), a co-ordinating but not an adequate planning office; various inter-Service committees, mostly headed by lower ranking officers, or their three, separate Service Headquarters.

From recent press reports the American attempt to create a unified strategic planning body does not appear to have been entirely successful.\*

### *British Experience*

Apart from similarity to our constitutional and administrative precepts and practices, British conduct of Defence matters has the commendable feature of victory in two world wars in both of which the British fought constantly from the very beginning, at great odds and considerable initial disadvantages. The present day Defence organisation of the United Kingdom is a typical evolution of British empiricism. After Waterloo (1815) and until the Crimean War (1854-56) British forces did not take part in a major action or campaign. Gross military ineptitude in all military spheres throughout this small

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\* See the London Economist of 23 April 1955, pages 290-1.

war resulted in a number of reforms.\* These were not sufficiently thorough to prevent a further debacle of arms during and immediately after the Boer War (1899-1902). We of present-day India should heed the cryptic comment of Joseph Chamberlain, British Prime Minister during the Boer War period: he said that British soldiers feared their Ministry of Defence more than the Boers! British military thought had also been greatly impressed by the dramatic military successes of Prussia in the Franco-German War (1870-1) while technical innovations and naval actions during the American Civil War (1861-5) had stimulated self-criticism in British naval circles.

At the beginning of the Twentieth Century, a parliamentary Committee was appointed to examine Defence organisation and to recommend reforms; Lord Esher was its Chairman. It is often said that its report, known as the Esher Report (1904), laid the foundations of modern British Defence organisation. This is not entirely true as a Committee of Imperial Defence, the fundamental recommendation of the Esher Committee, was already in existence while the introduction of the Army Council was copied from the Board of Admiralty which dates back to 1832 in a form resembling the present-day organisation.† The main contribution of the Esher Report, which was accepted and implemented, was to give form, purpose, continuity and clarity to British National Defence organisation. It also made original recommendations the principal one being the appointment of a Chief of the General Staff, later re-designated as the Chief of the Imperial General Staff (CIGS).

To the work of the Committee of Imperial Defence is attributable the comparatively smooth mobilisation of men and material that took place in 1914. Mistakes were also made: for

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\* See Woodham-Smith, C, *The Reason Why*, 1953. Principal reforms included the abolition of the practice of purchasing commissions; the institution of a system of Colour and Reserve Service, the banning of the enlistment of criminals, the abolition of the appointment of Commander-in-Chief and various inconclusive changes at the War Office.

† And in origin as long ago as 1214 when the first Keeper of the King's Ships was appointed.

example, bad co-ordination with the Foreign Office resulted in an Anglo-French misunderstanding of the commitments involved in military level talks. During both World Wars the Committee of Imperial Defence was replaced by the War Cabinet; thus the Committee of Imperial Defence was, in effect, a 'shadow' War Cabinet. Except for the period 1920-24, the Prime Minister always presided over the Committee of Imperial Defence.

An important innovation, which antedates its American counterpart already described, was the institution of the Chiefs of Staff Committee in 1923. Subsequently, permanent joint staffs were provided for planning and intelligence. A permanent Chairman has now been appointed.

The British Ministry of Defence is responsible for the apportionment of resources in accordance with the strategical directions of the Committee of Imperial Defence; common administrative policy; settlement through the Defence Minister of inter-Service disagreements and the administration of inter-Service institutions such as the Imperial Defence College and the School of Land|Air Warfare. Within these confines, the Permanent Under-Secretary of State (comparable to our Defence Secretary) plays an important part but, as in the United States, it would be regarded as unconstitutional and inexpedient to interpose him between the Chiefs of Staff and the Minister as a channel of communication where matters of strategy and military policy are involved.

#### THE FOUNDATIONS OF OUR NATIONAL DEFENCE ORGANISATION

##### *Points of Departure*

Whatever we may suggest to improve our National Defence organisation must be in consonance with our Constitution, parliamentary practice and state of economic development. The three cardinal principles of our Constitution, the Supremacy of Parliament, Rule of Law, and Collective Cabinet Responsibility must be scrupulously maintained. Undue delegation of parliamentary powers whereby the Services or civil servants might directly determine national policies must be assiduously precluded. Within the Services themselves there must be no interference by the Cabinet or Parliament in matters affecting

military discipline ; all forms of patronage must be excluded. It must be ensured that those responsible for the conduct of operations in war have an effective voice in the shaping of military policies.

Pre-war, the government of India was a relatively small, if at times difficult, matter. As far as Defence was concerned, the strategic role of India was determined by the British Cabinet and the Committee of Imperial Defence in consultation with the Government of India. In the Viceroy's Council the Defence Member was the Commander-in-Chief of all three Services. This monolithic Defence structure—the responsibilities of the one Defence Member are vested today in no less than seven different persons\*—may appear to have had commendable expediency. However, we should not make a comparison as popular democratic control of Defence issues was absent before Independence ; British Imperial strategy visualised that their command of the Indian Ocean and the geographical isolation of the Indian sub-continent precluded an immediate external threat to India. For these and other reasons, the mobilisation of the Indian Armed Forces was to be slow and most of the equipment and officers would be British. Early British setbacks and Japan's entry into the war necessitated the total re-casting of British strategy. Perhaps the most radical change was in the role allotted to India. The strength of our Armed Forces was expanded from just over 150,000 in 1939 to over two million by 1944. Despite this expansion, by the end of the war India was no more than a gigantic advanced base ; no attempt had been made either to establish adequate defence industries or to integrate the overall national industry and economy to meet the demands of war. Thus while we were handed on excellent Armed Forces with traditions and fighting spirit second to none, the same experience was non-existent in the sphere of higher defence organisation and defence industry. We had to create our organisation for National Defence virtually ab initio.

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\* Viz, the Defence Minister, the Minister for Defence Organisation, the two Deputy Defence Ministers and the three Chiefs of Staff.

It is only during the past two or three years that conditions have become sufficiently settled for our Government to be able to consider putting our organisation for National Defence onto a sound and permanent footing. The first two important steps in this connection were the appointment of Dr. K. N. Katju as Defence Minister—the Prime Minister being too heavily laden to devote sufficient attention to the department—and the re-designation of the Service Chiefs.

#### *Re-organisation of Existing Defence Machinery*

At the very highest level our National Defence organisation rests on secure foundations ; the Cabinet and its Defence Committee are adequate and flexible instruments of Government both for peacetime planning and wartime execution. Immediately below this level the present functional division of responsibilities between the Deputy Ministers and the Minister of Defence Organisation should be re-examined with a view to giving each Service its own Minister with, possibly, a Minister as Deputy and Minister for Defence Co-ordination and Mobilisation. The artificial division of the Cabinet Secretariat, by which there is a Military Wing, should be abolished : civil and military distinction at national level is immature. Within the Cabinet Secretariat an integrated military staff would, of course, be required.

A primary decision at Cabinet level is long overdue to clarify the position of the Service Chiefs in relation to the Ministry of Defence and to provide the proper perspective to National Defence in this country. The Chiefs of Staff Committee must continue to be an advisory body but it should be transformed into an effective instrument of National Defence planning. It should report to the Defence Committee of the Cabinet. Decisions affecting the fighting readiness of the Armed Forces must be made by those capable of evaluating our combat effectiveness. A permanent chairman for the Chiefs of Staff Committee would be premature perhaps, but a small permanent Joint Staff is necessary. The various existing minor inter-Service committees such as those for Joint Training, Electronics and Communications, etc. should be re-formed into this Joint Staff.

The role of the Ministry of Defence should be redefined to preclude its duplicating the functions adequately performed at present by each Service Headquarters. Its charter should be the apportionment of resources between the three Services in accordance with the broad directive of the Defence Committee of the Cabinet; administrative policy common to the three Services and the administration of inter-Service establishments such as the National Defence Academy, the Defence Science Organisation, etc. In addition it should act as the Defence Minister's secretariat, and as the intermediary between other Government departments. Co-ordination between the three Services should be effected at the level of the Chiefs of Staff Committee, or the Defence Minister himself. Outside of this sphere, files and records should be maintained by the Service Headquarters concerned or the Joint Staff to be established for the Chiefs of Staff Committee.

The functions of the Ministry of Finance (Defence) require drastic overhauling also. This has been the subject of an official report on the workings of our Government by Paul H. Appleby —

"Review at successively higher levels of matters originating at lower levels seems to me to be too often in the original low level terms and not often enough or sufficiently enough in the terms appropriate and peculiar to the higher level. Similarly, low-ranking Finance people when reviewing proposals from operating ministries should not assume the responsibilities of these ministries but should seek to review in terms of government-wide significance. Much time is lost, frustration incurred, and responsibility confused, by failure to operate on one's proper level!"\*

Financial Advisers should take their places as integrated colleagues in each Service. Their functions should be to assist the Services in spending their budget allocations wisely, instead of hamstringing expenditure as they tend to do at present.

The re-organisation of Service Headquarters would be a natural corollary. The formation of Councils or Boards would

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\* See Appleby, P, Report on Public Administration in India, 1953.

provide each Service with an experienced body for its proper administration and guidance. At present, in the Army the largest Service, major issues of policy have to be referred to Army Commanders in each Command. If there was an Army Council, its members being Generals or Lieutenant Generals, sufficient experience and seniority would be available at Army Headquarters itself. The same applies to the other two Services. A Deputy Chief is required in the Army as already exists in the other two Services for the Chiefs will tend to become more and more pre-occupied by the re-organised Chiefs of Staff Committee and direct consultations with Ministers.

### *New Measures*

We require an agency similar to the American Office of Defence Mobilisation but with rather different functions. The American problem is to allocate existing resources for a war that might be 'just around the corner'. Our problem is to integrate into our expanding economy plans for conversion to a war economy, should the need arise. Our National Defence Planning Agency should further self-sufficiency in Defence requirements by progressive replacement of imports by indigenous production as our Five-Year Plans yield their fruits; it should have its own cell in our Planning Commission. Ordnance Factories would be absorbed into this agency. There is room for much improvement in the manner in which our Ordnance Factories are controlled and administered. Once under the control of the proposed agency, they would be brought into closer touch with commercial practices and rationalisation and more efficient operation would follow.

We require either a separate Ministry of Supply, with its own military division staffed largely by military officers, or a supply division of our National Defence Planning Agency. Problems of supply are so complex that the former suggestion is probably the most practical and the best suited to our governmental organisation.\*

\* See British History of the Second World War, Civil Series, especially — Postan MM, *British War Production*.

Hargreaves, EC, and Gowing, MM, *Civil Industry and Trade*.  
Hancock, WK, *British War Economy*.

All published by HMSO, London, 1952.

An integrated national intelligence agency should be established.

In addition to existing ones, there should be a series of Standing Committees to study important military questions of the moment. Examples are the role to be played in war and the policy to be adopted towards second line forces such as the Territorial Army, the National Volunteer Force, a Civil Defence organisation, Community Project Volunteers, etc; the problem of Broad Based Recruitment; Reserves and Resettlement; Other Rank problems; Officer problems such as selection and recruitment, the vexed question of Pay and Allowances, enforced retirement, resettlement, etc; a further example is a committee on research, development and design to integrate the efforts of the Defence Science Organisation, the various National Laboratories, those universities carrying out pure research and comparable private activity in commercial firms. There are many other subjects for which such committees might be formed.

It is essential to promote, in peace, while there is still time, the requisite knowledge, mutual respect, understanding and insight into Defence problems so as to engender in war a homogeneous, united and harmonious approach capable of withstanding extreme mental and physical strain. In peace Government has many and divergent policies. In war there is only one policy: that which aids victory. Positive measures can be taken to promote co-operation and co-ordination at all levels. A panel of potentially useful officer material should be compiled. A certain number of those on the panel who enter Government service, especially in the Foreign, Administrative and Police Services and others in private employment, should be inducted as National Defence Reserve officers for eighteen months to two years and then transferred to the Officer Reserve. This might require a selective Conscription Bill. The result would be a broader identification with the Services in war and a better understanding of their problems in peace; it would provide a reserve of officers—always a major problem at the outbreak of a war. Wartime depletion of the civil cadre should be acceptable as no country has ever seriously entertained making the civil service a hundred per cent 'reserved occupation'. It would



not lead to militarism, would ensure youth in junior officers, reduce career promotion blocks and reduce the pensions bill, as fewer career officers would be required. There is a need for the joint training of senior officers from the three Services, various civil cadres and certain key industries—such as shipping, railways, aircraft, steel and aluminium, etc. The Defence Services Staff College trains a few junior officers of the Defence Science Organisation and the Administrative Service but this is inadequate in both numbers and seniority. We require a separate National Defence College where senior officers, officials and executives earmarked for further advancement would study problems at national level together. The establishment of such an institution has been proposed already ; it would be comparable to the Imperial Defence College, the Canadian National Defence College and the United States War College.

There should be far more active encouragement of higher defence study, both at home and abroad. There should be no objection to granting study leave, on the same lines as applies to the Army Medical Corps, to Service and other officers who wish to study, say, War Economics, War Production, Constitutional History in relation to Defence, Military History, Psychology and Social Science, to give a few examples.

Reference has already been made to the important role played in modern National Defence by the scientist. In 1947, our Defence Science Organisation was in the same position as our higher defence structure : virtually non-existent. Considerable progress has been made since then but we shall need to nurture scientific research in the defence field for many years before it can yield much fruit. The importance of scientific advancement will be realised if one recalls that it was superior maritime science that brought European traders to our shores and their superior technology and new weapons of war that enabled them to organise military campaigns against us with success despite our far greater numbers and courage. Such a position of technical inferiority exists at present ; it must be overcome and must never arise again.

Finally, we should change our attitude towards Civil Defence. This does not mean that we should spend vast sums

on geiger counters and underground tunnels. Our Civil Defence organisation should be an adjunct to existing second line forces, such as the Territorial Army and the new National Volunteer Force ; it has a peacetime role as a National Disaster organisation. If panic and rumour are to be averted in war, the Government must take the general public into confidence and forewarn them of the tribulations, terror, suffering and sacrifices that will be involved. In the same way as the Infantry officer and soldier are inured to war's dangers by training and develop rugged, resilient mentalities, so too civilians must be taught elementary measures of self-protection, made aware that they also serve the nation in war, must remain at their posts and continue to produce for the war effort. They will do this only if taught how to survive enemy attacks and to have faith that their country's National Defence organisation will prevail and lead the entire nation to victory.

#### SUMMARY OF RECOMMENDATIONS

Our organisation for National Defence requires a major overhaul. This could not be done earlier for a variety of reasons but the time is now opportune for laying secure foundations. We must ensure that our National Defence is built up in consonance with our Constitution and at the same rate of development as other spheres of national activity. The aim is to provide the country with a National Defence organisation capable of protecting our people and territory and leading the nation to victory in the event of war.

At Cabinet and Government Committee levels, National Defence machinery is adequate but we should examine the division of responsibility between Ministers. The Cabinet Secretariat should be a unity with military staff integrated into it, but no separate Military Wing.

The Chiefs of Staff Committee should become the main instrument of National Defence planning, with its own permanent joint staff. It should tender advice direct to the Defence Minister.

The Ministry of Defence should be reorganised and its role redefined so that it does not duplicate functions which are

adequately performed at present by each Service Headquarters. It should be the Defence Minister's Secretariat.

Defence Finance also requires thorough re-organisation so that it serves the true purpose of Finance: to ensure that the Defence Budget is adequate and is utilised so as to further the National Defence programme to the greatest possible extent within the overall national economy.

Within the Services themselves the institution of Councils or Boards is recommended while a Deputy Chief of Staff is required in the Army as in the other two Services.

In addition, our National Defence programme requires certain entirely new measures. We require a National Defence Planning agency. Its task would be to plan our National Defence alongside our developing economy so as to ensure a smooth transition onto a war footing of our man-power and industrial potential, should the need arise. This would be a tremendous advance in our Defence preparedness and lessen the chance of our being attacked. The present unsatisfactory Ordnance Factories organisation should be amalgamated with this new agency. We should form an integrated, single National Intelligence agency.

The shape that such a National Defence organisation should take is shown in Chart 2.

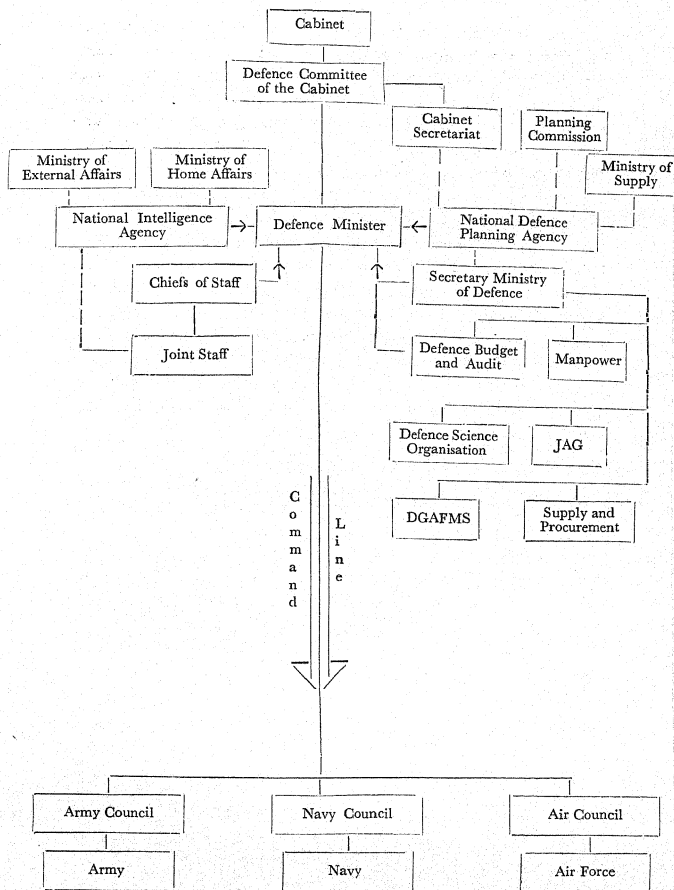
Standing Committees should be formed to study important military questions of the moment.

Training is an important matter as thereby understanding and co-operation is promoted. This should be broad in scope. A war reserve of junior officers should be created; this may entail a Selective Conscription Bill. Study groups and symposiums should be commenced and later formed into a National Defence College comparable to similar institutions abroad. Higher defence study at universities and similar institutions in India, as well as sending selected personnel overseas should be actively encouraged.

The important role of the scientist in National Defence has received full recognition since 1947. We must continue to

CHART 2

## PROPOSED ORGANISATION FOR NATIONAL DEFENCE



nurture our Defence Science Organisation so that our Armed Forces become as well equipped technically as they are morally.

Civil Defence has received little attention in this country but if we are to avert panic, rumour and confusion amongst the civil population in war, and ensure that they continue with their war effort, it is necessary to teach them elementary measures of self-protection and inculcate in them the same resolution that keeps the soldier at his post in the face of danger. Therefore, our Civil Defence should be expanded.

#### CONCLUSION

National Defence is only one aspect of national life and, being dynamic, it is constantly evolving. No conclusive solution can be put forward which will guarantee security in peace and victory in war. All we can say is that if we devise a National Defence programme of sufficient realism and flexibility, then we shall make an important contribution to the preservation of peace while, in the event of war, we will be deserving of victory. We should not only trust in God but also "keep our powder dry".

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## FINANCE AND AFHQ

### RELATIONSHIP BETWEEN THE MINISTRY OF FINANCE (DEFENCE) AND THE THREE SERVICE HEADQUARTERS\*

BATUK SINGH

I DEEM it a great privilege to have been asked to give a short talk on the subject of Finance and its relationship with the three Service Headquarters. Needless to say this subject is a very important one as, in a democratic set-up such as ours, it is of the utmost importance that we all understand the basic principles underlying the administration of public funds, especially Defence Funds, and you, who are going to be the topmost administrators in the Defence Services in time to come, do need familiarizing yourself with these principles from now onwards.

#### ORIGIN OF THE MILITARY FINANCE BRANCH

As you are already fully aware how the Armed Forces Headquarters are organized, I shall not have to say much about it in the course of this talk. As regards your Finance, a little detail is necessary. As far as I have been able to ascertain, the Military Finance Branch came into being, almost exactly 50 years ago, namely on 13th April, 1906, in consequence of a resolution published by the Government of India on the 27th April, 1906, under the inspiration of perhaps the most distinguished soldier of the old Indian Army, Lord Kitchener. The resolution\*\* read as follows:—

“In consequence of the abolition of the Military Department of the Government of India, the Governor-General in Council is pleased to notify that with effect from the 13th of April 1906, the department of Military Accounts, which was

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\* From a lecture delivered at the Defence Services Staff College on 5th April 1955 with Major-General P. S. Gyani in the Chair. Mr. Batuk Singh is Additional Financial Adviser, Ministry of Finance (Defence). The views expressed are his own and not necessarily those of the Ministry of Finance (Ed.)

\*\* No. 2343-E. O. dated the 27th April 1906.

formerly subordinate to the Military Department, shall be subordinate to the Finance Department of the Government of India.

2. Further, *with the object of making financial control over military expenditure more constant and efficacious*, the Governor-General in Council has resolved, with the sanction of His Majesty's Secretary of State for India, to create a special Branch of the Finance Department (to be styled the Military Finance Branch) which shall deal, in their financial aspect, with proposals involving expenditure or the application of financial rules emanating from, or submitted to, the Army Department and the Department of Military Supply.

3. The Military Finance Branch, which will be a branch of the Finance Department of the Government of India, will for the present, and with effect from the 13th of April 1906, be under a separate Secretary to the Government of India, who will have under him a Deputy Secretary, two Assistant Secretaries, and a suitable clerical establishment. The Military Accountant-General will also be an ex-officio Deputy Secretary in the Military Finance branch of the Finance Department, and the department of Military Accounts will be under its supervision and control.

4. *To facilitate these new arrangements, the Military Finance Secretary and his establishment will be located in the same office building as the Army Department, and the said Secretary will be in constant personal communication with His Excellency the Commander-in-Chief and the Hon'ble Member for Military Supply, who will thus be able, whenever this is thought desirable, to take his advice on the financial aspect of any military question before making a formal reference to the Finance Department through its Military Finance Branch. He will also be a member of any consultative committees which may be formed to consider matters relating to Army Administration. At the same time, he will be in no way subordinate to the military authorities, but will be responsible only to the Hon'ble Financial Member, and to His Excellency the Governor-General.*

5. The Governor-General in Council trusts that these arrangements will not only, as above observed, make the requisite financial control over military expenditure more constant and complete, but that they will obviate any friction or misunderstanding which might arise were the branch of the Finance Department charged with the carrying out of this duty not in close touch with the military authorities.

6. All references that were formerly made by the Military Department to the Finance Department or by the Military Department to the Military Accountant-General in the capacity of financial adviser, will now be made to the Finance Department (through its Military Finance branch) by the Army Department or the Department of Military Supply as the case may be."

## FUNCTIONS OF THE FINANCIAL ADVISER

The history of the relationship between the Armed Forces and their Finance during the last 50 years amply bears proof of the soundness of the step the Governor-General and his colleagues took in 1906. This relationship has stood the strain of two world wars and many other, comparatively speaking, minor upheavals. This is most significant. Although the nomenclatures have changed here and there, the basic *functions* of the Financial Adviser to the Defence Services have remained unchanged ever since the auspicious "Baishakhi" day in 1906 on which he came into being. In brief, these functions can be summarised as follows:—

- (1) The Financial Adviser is charged with the responsibility of preventing irregularities in expenditure and of ensuring that financial principles are duly observed.
- (2) He assists the Ministry of Defence and the three Service Chiefs and their staff in financial administration of the Defence Services and in promoting economy in Defence expenditure.
- (3) He scrutinizes and compiles Defence Services budgets and other estimates, and prepares the annual appropriation accounts.

I shall now say how he fulfils the task allotted to him. As an officer of the Ministry of Finance, it is his duty to scrutinize, with reference to financial principles, and in the interest of public economy, all proposals involving Defence expenditure, and to advise whether they should be accepted. He has to keep himself in constant touch with Civil Finance and has direct approach to the Finance Minister as one of the senior-most officers of the Finance Ministry. As Financial Adviser to the Defence Services he has direct access to the Defence Minister and he may, when he thinks it desirable, require that any case in which the decision, in his opinion, contravenes financial principles, be submitted to the Finance Minister or the Defence Minister before it is submitted to the Finance Minister. It is in this capacity that he is a member of various Committees on Defence matters. He is also the Chief Accounting Officer for Defence expenditure, responsible for internal audit



and accounting of all monies voted by Parliament for Defence purposes. This responsibility he discharges through the organization of the Controller General of Defence Accounts which he controls and administers. It is in his capacity as the Chief Accounts Officer to the Defence Services that he prepares the annual Appropriation Accounts.

#### THE ORGANISATION

If you look at the FA's organisation, you will find that this is specially designed to enable him to discharge his triple responsibilities satisfactorily. Apart from two Additional Financial Advisers and a Joint Financial Adviser to help him, there are a number of Deputy Financial Advisers attached to Principal Staff Officers at Army Headquarters, one each to the Air Force and Naval Headquarters, one to the E-in-C, and one to the Ordnance Factories. In view of the complexity and volume of work, there is now a separate DFA for Defence Pensions alone. Then, of course, there is a DFA (Budget). They sit in the same building as the Service Chief or the P.S.O. to whom they are accredited. It is the duty of these officers to dispose of finally, on behalf of the Financial Adviser, such matters as they feel competent to decide. Other matters they may submit to the Joint Financial Adviser, or the Additional Financial Advisers or even the Financial Adviser. Their principal function is to advise and assist the Administration in regard to financial questions arising in the Services, Directorates, or section of the administrative branch to which they are attached. They help the Head of that Branch or Service in the preparation of their annual estimates, and also in watching the progress of expenditure against budget grants and allotments and in examining important irregularities. They keep the Financial Adviser informed through Deputy Financial Adviser (Budget) of any savings likely to be effected, or any excess which may arise as a result of the periodical review of expenditure sheets sent to them by the Controller General of Defence Accounts. They also deal with appeals against internal audit decisions in consultation with the CGDA.

In brief, the practice is that the Deputy Financial Adviser works in the closest possible liaison with his PSO or the Service

Chief to whom he is attached, and the Joint Secretary and his Deputies of the Ministry of Defence concerned. In fact he is now treated for all practical purposes as an integral part of the Defence set-up although theoretically he belongs to another Ministry and all financial issues are automatically referred to him for advice. It is hardly necessary for me to emphasize the obvious advantages of this close integration of work between Finance Defence and Service Headquarters. The red-tape is cut down to the minimum and decisions are usually quickly taken after a discussion across the table. In fact, in the words of Sir James Meston, "the machinery of Defence financial control is inside the Defence organisation and yet independent of it." As far as I know, no other Ministry of the Government of India or department excepting, perhaps, the Railways, has this advantage.

#### FINANCIAL CONTROL

I would now refer to a broader issue which may be in the minds of many of you. A question arises as to why there should be any necessity to consult Finance at all once the budget has been approved by the legislature. This is a legitimate question, but it ignores the fact that we are a parliamentary democracy and therefore although every *expenditure* requires the prior approval of Parliament, once Parliament has given its sanction, the matter is not left at that. Parliament has also to satisfy itself, through various instruments at its disposal, that the money that it has voted has been spent for the purpose for which the vote was given and that no irregularity has occurred in that process. There are various ways of doing this. Periodical scrutiny of the estimates of the various Ministries is carried out by the Estimates Committee of Parliament. Their appropriation accounts are gone into, usually in some detail, by the Public Accounts Committee — another Committee of Parliament — which also examines the Audit Report, prepared by the Comptroller & Auditor General. But all these bodies and organizations are outside the Government of India, who are the agents of Parliament for administering large public funds according to rules. While every Ministry is responsible for using prudence and commonsense in spending monies placed

at its disposal, and is thus answerable to Parliament for its action, the Government of India have, in the Ministry of Finance, specialized machinery which helps the administrative Ministries in ensuring regularity as well as prudent administration of these funds. Technically, the control by the Ministry of Finance of expenditure must always be subsidiary to that of Parliament. In effect, however, it both precedes and follows parliamentary control. For example, annual estimates are not submitted to Parliament without the prior approval of the Ministry of Finance, and thus the control of the Ministry of Finance, starts even before Parliament has voted the sum. The same thing applies to supplementary estimates. Further, the Ministry of Finance is also concerned with audit supervision, which, as already stated, is exercised through the Comptroller & Auditor General and the Public Accounts Committee.

What is the rationale behind financial control? At the very start, I would repeat a common observation that howsoever able an administrative organisation may be, its thinking is usually coloured by the policies of that organisation alone. There is, therefore, definitely an important and legitimate place for the criticism of a friendly critic who is outside the department. I can tell you with 12 years' experience of working in (Defence) Finance that what we do is to conduct a rigorous, but fair, cross-examination when a proposal is sent to us. We generally ask only those questions which an intelligent taxpayer, bent on getting the best value for his money, would put. A second reason is that Finance are aware of all the plans and proposals and, as the monies available are not enough to meet all these commitments, they have to assist the administration in selecting the very best from all these good proposals. An example may be that a proposal to build 2,000 flats for officers may have to give way in favour of 500 officers' flats and 100 stores sheds, because the supply of cement and steel may not adequately cover both the projects. There is no doubt that the primary responsibility for cutting one's coat according to the cloth available rests on the administrative Ministry concerned, but the coat is a little more stylishly cut and stitched if a friendly and well-informed critic helps the tailor at various stages before the finishing touch is given to it.

A democracy like ours essentially means collective responsibility to the public and the public is never fully satisfied or assured if its political, administrative, economic and financial interests are controlled by one cell howsoever competent or able it may be. This feature of a democratic society explains the necessity for checks and balances at all stages and levels of administration. It also underlines the need for the existence of a strong Finance Ministry inside Government and a powerful audit organisation outside. The proper functioning of a true Parliamentary democracy is impossible without these aids.

#### CERTAIN CRITICISMS

To revert to the relationship between AFHQ and ourselves, there have been one or two criticisms of our methods of work. One of them is that we exercise "veto" on proposals. That is, I can assure you, absolutely wrong. No Finance worth the name can ride roughshod over the fundamental policies of a Ministry on financial grounds alone. So far as we are concerned, that is not possible even if someone foolishly wanted to do so. Although technically we are outside Defence, we are, as I have said earlier, an integral part of the Defence set-up and as such we always try our best to carry the Ministry of Defence and the Service Headquarters with us. We have always impressed on all our officers that the process of financial advice and control must be carried out in a spirit of mutual confidence and understanding between the Ministry of Defence, the Service Headquarters and ourselves. Defence expenditure is the biggest single item of expenditure in the Government of India, and naturally we are very much interested in seeing that it is prudently administered. It is up to the Ministry of Defence and the Service Headquarters to ensure that they bring us into their thinking as early as possible, before they formally formulate their policies, so that infructuous expenditure of effort and time is avoided. As you are aware, no matter having financial implication can go to the Cabinet until it has been discussed with us and our views incorporated in the paper to be sent to the Cabinet. Hence the advantages of consulting Finance from the very start are so obvious as to need no emphasis. I am glad to be able to say that in actual practice, we are taken

into confidence from the very moment a proposal is placed on the anvil and my claim in all humility is that our criticism and advice have helped the Ministry of Defence and Service Headquarters on most occasions. Both are fully aware of the fact that our advice is given in the light of historical doctrines and under a body of established case-laws for which we quite rightly have great respect. There have no doubt been occasional differences of opinion between us, but all of them have been resolved in accordance with the usual procedure. In any event, they have left no feeling of frustration, irritation or ill-will. This, I can assure you, is in accord with the best possible traditions of a Parliamentary democracy.

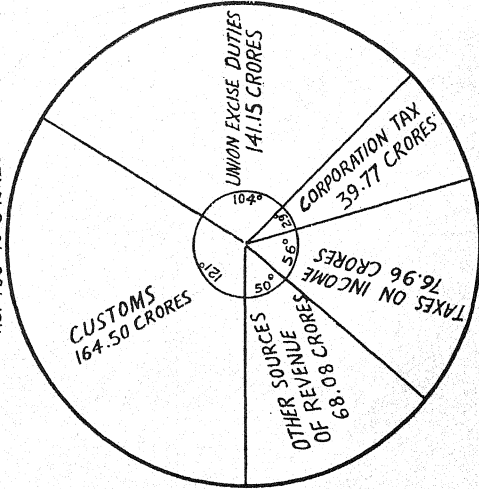
It is also alleged, sometimes, that the Ministry of Finance has too much power. This, I submit, is not quite correct. There is little doubt that we are so close to the source of decision that we are bound to have some power unless we are nitwits. I have, however, always had the feeling that this power has been constantly exercised in the interest of the Defence Services as well as the tax-payer. Frankly, we would not last a week if the so-called power that we possess is misused to satisfy someone's ego or fancy and not in favour of helping the administration to make each rupee go as far as possible. In other words, whatever powers we may have, they are not absolute and in no way do they detract from departmental responsibility for extravagance or misspending of public funds.

As you perhaps know, the present mechanism of financial control may change in the near future, but I am convinced that whatever change may occur will occur only technically so far as you and I are concerned. The close co-operation and the understanding we have established during the last 50 years between the Ministry of Defence, the Defence Services and ourselves, will continue to remain the most distinguishing feature of the financial administration of the Defence Services. Our objective is the same, i.e. economy without the sacrifice of efficiency: I have always held that efficiency and economy need not be at war. I would go a step further and say that no efficiency is possible without economy. This may sound strange to you, but it is a fact. I would emphasize, in the words of

# BUDGET 55-56.

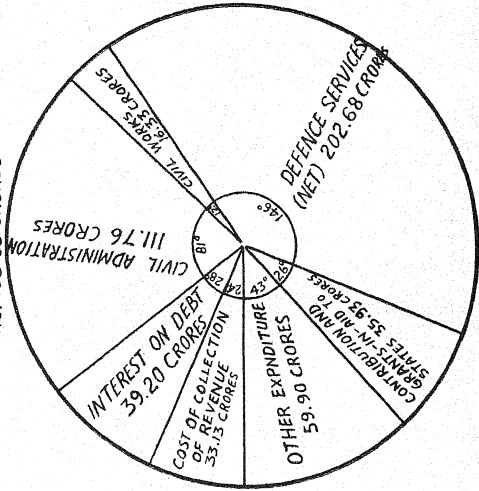
## REVENUE STRUCTURE OF THE GOVERNMENT OF INDIA.

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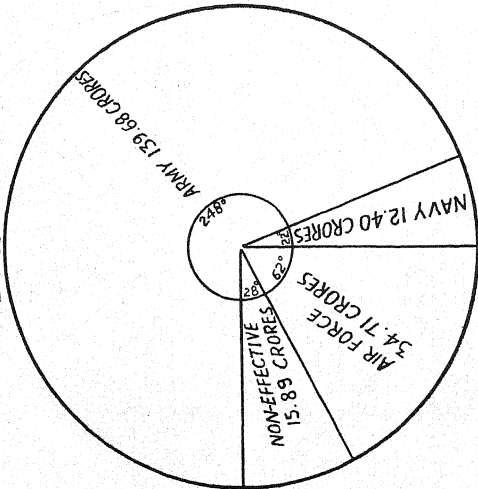
## EXPENDITURE STRUCTURE OF THE GOVERNMENT OF INDIA.

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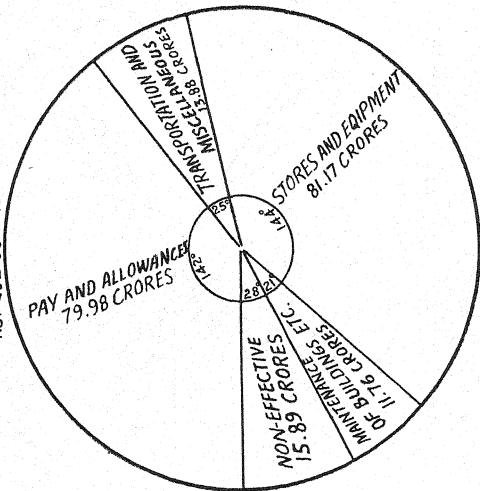
ANALYSIS OF NET DEFENCE  
EXPENDITURE BY THE SERVICES  
& NON EFFECTIVE CHARGES.

RS. 202.68 CRORES



ANALYSIS OF NET DEFENCE  
EXPENDITURE BY THE NATURE  
OF THE CHARGES.

RS. 202.68 CRORES



Professor Wilson, that 'without sound finance, sound administration is impossible.' So, please be careful when you handle public money. What the Defence Services and ourselves are both aiming, is to get the best value for the monies the representatives of the people place at our disposal every year. India is a very poor country and can ill afford to waste a single pie of about half its revenues spent on Defence. Let us hope that we all shall continue to co-operate towards achieving that goal of wise, prudent and economical spending of public funds to the lasting benefit of the Defence Services and the country.

#### REVENUE AND EXPENDITURE

As the time is running short, there is only one more point to which I would invite your attention before I close this talk. You may enquire how best we can help each other in achieving the best value for the money which Parliament (i.e. the representatives of the tax-payer) gives us. Before I reply to this question in the abstract, I would like you to see the four charts which the Commandant has very kindly agreed to place on this Board at my request. The first chart shows the main sources of Revenue of the Government of India, and the second one the principal items of expenditure which are met out of these Revenues. As these two charts are inter-linked, I am taking them together. The first point that will irresistibly strike you is that nearly half the expenditure is on the Defence Services. I am pointedly drawing your attention to this aspect of the matter to underline how necessary it is for us to weigh all aspects of a proposal most carefully before we, in the Defence Services, spend any monies. As you are aware, enormous resources are urgently required for development purposes, but Government is fully conscious of the need for adequate defence of the country and is making whatever provision it can towards this end. Without going into further details of revenue and expenditure, I would now refer to chart No. 3 which shows what we spend on the Army, Navy and Air Force separately and also on non-effective charges. Chart No. 4 gives you at a glance the breakdown of this expenditure by broad categories. As these figures are likely to be of immediate interest to us, let us go into them in a little more detail.



You will see that a big chunk of the Defence money is spent on pay and allowances. You will agree with me that there is not much we can do about it, except that we should be careful about the quantum and categories of establishments we ask Government to sanction, and which the three Service Headquarters progress with the Ministries of Defence and Finance (Defence). I would particularly draw attention to your requirement of the civilian staff in this connection. We have about 2½ lakhs of civilians working under the Ministry of Defence, and I am fairly certain that if we examine the load of work carefully, we may be able to effect substantial savings under this head of expenditure.

Non-effective expenditure is something about which we cannot do much. Pensions and gratuities are payable in accordance with rules which are strictly enforced. There is hardly any room for suggesting savings there.

But then we come to the big amount of money that we spend on stores, equipment, transportation and maintenance of buildings. Whereas it is always the endeavour of Government to give you the best possible equipment to enable you to carry out the role they have allotted to you, there is little doubt that wastages occur at various stages and it is up to the lower formations, Service Headquarters and the Ministries of Defence and Finance (Defence) to put their finger unerringly on these spots and economize. I am certain that substantial sums of money can be saved without affecting the efficiency of the Services if all officers, especially senior officers, look into things themselves. This matter acquires added significance, because, first, the more we save, the more we can spend on getting the latest equipment and stores for the Army, Navy and Air Force, which is the most urgent need of the hour. Secondly, it is probable that the Navy and Air Force will expand in the future, which will mean a considerable addition to stores, equipment and maintenance budget. It is, therefore, all the more necessary that we are on the alert and save every pie consistently with the maintenance of the fighting efficiency of the three Services. Thirdly, we must avoid extravagance in all forms to keep at a minimum deficit financing, which is at the scale of about Rs. 1 crore per day during this year.

You will, no doubt, notice that I have not said anything about Capital expenditure, which means buildings, and ships for the Navy. For the latter, i.e. ships, we have to depend on foreign sources and have to pay whatever we are asked to, although we can economize on their maintenance charges later, which is met from Revenue. As regards buildings, I am definitely of the opinion that, to meet our commitment of about Rs. 250 crores which is estimated to be the cost of all types of accommodation required by the Army, Navy, Air Force and the Ordnance Factories, cheaper specifications will be necessary and also standardized line-plans. Without some sort of a mass productive effort, I cannot visualize how we are going to get through this programme quickly, especially in view of the fact that cement, steel, timber and other requisites for building are in such short supply. I have no doubt that all of us will have to give considerable thought to this matter, so that with the amount of money that Government makes available for this purpose, we produce the maximum amount of accommodation in terms of square footage.

#### CONCLUSION

I have come to the end of this lecture and I must thank you for listening to me so patiently. I have indicated to you how the Ministry of Finance is organised, how it is controlled, how it works in close liaison with the three Service Headquarters and the Ministry of Defence, and what functions it performs. I have given you the broad lines on which my mind is working as regards economy in expenditure, and I have also indicated to you the fields in which the maximum possibilities for such economies are likely.

I thank you once more.

Before I sit down I would invite you to put questions, if any, in accordance with the usual custom. We have about 10 minutes left for this purpose.

#### DISCUSSION

QUESTION: What do you mean by economy?

ANSWER: Economy means

- (1) Not providing yourself with something you do not really need e.g. woollen suits in Madras, and
- (2) Providing yourself with something you need at the cheapest price. By the way, the cheapest price does not necessarily mean the lowest price. Durability, finish etc. are other considerations.

QUESTION : Once the Budget has been passed by Parliament why should anyone consult the Ministry of Finance ?

ANSWER : There are four main reasons why such consultation is considered necessary. First, many items are included in the Budget which have not been finally and fully examined by Finance before inclusion in the Estimates. This scrutiny has to be done later when greater details are available. Secondly, normal rules and regulations cannot possibly cover all contingencies. Every departure therefrom, whatever its financial implications, has to be decided upon, in consultation with the Ministry of Finance, to ensure that the spirit underlying them is not lost sight of and that financial principles and policies are properly observed. Thirdly, entirely new plans and programmes are often executed during a year by Ministries as matters of urgency and, although they may be financed by reappropriating savings within the sanctioned budget, the Ministry of Finance has to be consulted as regards their soundness from a financial point of view. Fourthly, all Ministries have to process their surrenders or supplementary grants, if any, through the Ministry of Finance and obviously this is a very important matter, on which the advice of the Finance Ministry is likely to be extremely valuable.

QUESTION : Audit nags us. It raises mostly petty objections which means wasting a lot of time. These objections are ultimately either withdrawn or the amount involved written off. Is all this bother therefore worthwhile ? Why not treat an officer as a gentleman ?

ANSWER : Audit derives its authority from your Constitution. Parliament has to satisfy itself that the money it gives you and me is spent for the purpose for which it has been given and the independent agency for telling Parliament how the

money has been actually spent is Audit. The accounting procedure is laid down by the Comptroller & Auditor General and we have little say in it.

I am sorry that petty objections should be raised, but please remember that an audit or accounts officer has little or no discretion in the matter and the only sure means of avoiding petty or big objections is to follow the rules strictly.

It is only gentlemen with whom audit deals. Others are looked after by the Police.

QUESTION: Why not increase our pay and allowances as Britain has recently done? They are not enough to attract good material to the Defence Services.

ANSWER: Although this question is not directly covered by the subject on which I have spoken, I would attempt a broad reply to it. Your pay and allowances are closely linked with those of the Civil. Any increase, as suggested by you, therefore will have serious repercussions all over the country with the result that the Central Government may be unable to meet this additional commitment. I would also like to mention that such a step would be opposed by the States which are already complaining that Central Government servants are very highly paid.

I am not sure of the correctness of the statement that, on the whole, we are not getting good boys for the Defence Services. But even if this complaint were justified, I do not know what remedy to suggest. The UPSC is also saying the same thing about the Civil Services. I have read in responsible papers that in the UK and USA too, topnotch boys are not joining the Defence or Civil Services. This can therefore be regarded as a general complaint in all democracies. The blunt fact is that no democratic Government can compete with private enterprise in this matter, and we shall have to reconcile ourselves to this rather depressing phenomenon. The raising of the scales of pay is no solution of the problem, for the simple reason that if Government did that, private enterprise would outbid them, not once, but always.

The example of Britain is not apt. It spends nearly ten times as much as we do on defence. It has full employment and a flourishing economy. It has no States to think about. Our problems are different and therefore our solutions cannot be identical with those of Britain.

QUESTION : What about our pensions, especially in the ranks of Major and Lt-Col beyond which more than 80% of us will not go ?

ANSWER : Government do recognise the handicap under which a majority of the Defence Service Officers will retire before doing 30 years, which is the normal expectation of service of a civilian. An element on account of premature retirement was, therefore, added to the pension admissible to Majors and Lt-Cols under the normal rule. It is about Rs. 90|- p.m. for the former and about Rs. 65|- for the latter.

MAJOR-GENERAL GYANI : We are grateful to the speaker for a very lucid and illuminating talk on the subject of relationship between AFHQ and their Finance and how they function. Some of us may not accept his views on one matter or the other, but there is little doubt that he has delivered an instructive and interesting lecture, likely to be of great help to us all, for which we are thankful to him.

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## THE MILITARY SITUATION IN EUROPE

BRIGADIER C. R. MANGAT-RAI

**T**HE military situation is so closely bound up with politics and economics that to understand it one must examine the political and economic background. It will, therefore, be a helpful preliminary to make a quick survey of Europe outlining the salient political and economic features. Over-shadowing the scene is the 'iron curtain' dividing Europe in two—a barrier to the free interchange of men and ideas.

At the end of World War II Russia emerged as the strongest military power in Europe and there was nothing on the mainland to oppose her—the Americans were returning home to demobilise, Germany had been smashed and France had not begun to recover. Russia was unable to resist using her strength to her advantage. She carried things too far and over Berlin the West took up the Russian challenge. Profoundly disturbed the Western powers united to form NATO and to rearm. There is now an uneasy balance of power between East and West. A faint breath of air occasionally rustles the so-called iron curtain but it has not been lifted.

### ENGLAND

Britain is the great bulwark of the European members of NATO. Her strong parliamentary government, her ancient institutions and her industrial capacity give her a stability that is absent elsewhere in Europe. However, she is not on as solid economic foundations as she used to be. She has created a state with full, even over-employment, but it has been to the accompaniment of a creeping inflation, which she has been

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\* The views expressed in this article are those of the author and do not necessarily have official backing. They are based on his studies during the Imperial Defence College Course of 1955, which included a tour of Western Europe, Italy and Turkey. (Ed.)

unable to check so far. She must manufacture and export to live, and as other countries establish their own industries, she has constantly to change the products she offers them for sale. Her industry has to be kept flexible. She has a wealth of technical skill and so long as she retains an advantage in a sufficient number of industries — just now she is well placed in the aircraft, shipping and electronics markets — she will continue to be stable and prosperous, but there is constant need for flexibility and she has little in the way of that reserve which is essential to flexibility.

#### FRANCE

France has not recovered either morally or economically from the humiliation of defeat at the hands of Germany in 1940. She is a rich agricultural country, and the technical skill and artistry of her people are second to none, but certain traits in French character, an over-developed individualism and an over dependence on logic, stand in the way of her becoming united and strong. She faces a number of intractable problems. She is embarrassed by widespread communism. Her economy is lop-sided in that too large a proportion of her population are engaged in the distributive trades. There is tax evasion on a large scale. Alcoholism has become a serious problem but vested interests in the wine industry prevent legislation for restricting consumption. Her relations with her colonies have gone sour but she is unable to rise to the occasion to set matters right with enlightened and generous action. Because of a multiplicity of political parties, no French government has a big enough majority or lasts long enough to carry out the reforms that are needed. But for all these weaknesses, France retains the cultural leadership of Europe. There is hope for the future. It is generally thought that she has passed the low point in her fortunes and that a renaissance is beginning.

#### THE BENELUX COUNTRIES

These prosperous little countries have minor domestic and social problems but are little bothered with internal communism and on the whole are good members of NATO. Holland's navy, which has always been formidable, and Belgium's gallant little

army are their best contributions to the defence of Western Europe.

#### WESTERN GERMANY

The Federal government has a great leader in Dr. Adenauer and has achieved a remarkable piece of reconstruction of war damage, helped greatly by generous American aid. Her industry is booming and she is becoming a rival to Britain in trade. I will touch later on the problem of German reunification and the recreation of German armed forces. Here I will merely remark that Adenauer is a staunch supporter of the West and is strongly in favour of Germany remaining a member of NATO.

#### THE NORTHERN FLANK

This consists of Norway and Denmark, an area that is sparsely populated and has small military forces. The German occupation of Norway in the last war has swung Norwegian public opinion away from a policy of neutrality. Norway now possesses newly-raised armed forces of good quality. Denmark is regarded as one of the least public-spirited of the members of the NATO club; her attitude tends to be to get a maximum of benefit from membership while making as small a contribution as possible. There is a good deal of what has been called 'proximity communism' in Denmark and in Northern Norway. Strategically these countries are important because they guard the exit from the Baltic and the Northern sea approaches from Russia.

#### THE SOUTHERN FLANK

This flank is guarded by Italy, Greece and Turkey. It is a long straggling flank, depending for communications on the sea. Italy has made a good recovery from the ravages of war and twenty years of Fascist rule, but she has both political and economic troubles. She has a large communist party and her coalition government lacks the backing to undertake a strong and effective programme of reform. Italy is over-populated and, because of the loss of her colonies and the virtual closing of the doors of the USA to immigrants, has little outlet for



her surplus population. The result is large-scale unemployment. She needs capital for developing herself. She has just embarked on a new ten year plan which, if she finds the capital for it, will help to set her on her feet.

Greece, for the present, has been saved from communism. She has much building up to do after the upheavals of the war and the subsequent struggle against communist guerillas. She has a useful little navy.

Turkey has the makings of a prosperous country. She is as big as France with less than half the population. She has ample mineral resources and a homogeneous population. At present, however, her financial position is unsound. She is trying to develop herself too fast and is maintaining a false rate of exchange. She has a flourishing black market in currency. She is apprehensive of her Northern neighbour and has large conscript armed forces. The period of national service is two years with a fourteen week period of basic training. Her forces have high morale and are well equipped but, necessarily, with the peasant manpower on which she depends, they are not well trained technically. My general impression of Turkey was that her industry and development was lagging behind that of India. She, very wisely I think, adopted the Roman script for general use, which makes it easier for her to fit into the NATO family.

It is the general opinion in SHAPE that the Italian, Greek and Turkish forces would give a good account of themselves in the defence of their own territory. Recently the Southern flank has been weakened by the bad relations engendered between Greece and Turkey over Cyprus.

#### PORTUGAL

Only brief mention need be made of Portugal. She is a member of NATO but as she contributes no forces to NATO she hardly enters into consideration here.

#### BEHIND THE 'IRON CURTAIN'

Except for a visit to Berlin I have no first hand knowledge of conditions behind the 'iron curtain' and I will, therefore, keep

my remarks very brief. Stalin wielded dictatorial power. His policies did much harm to Russia and brought about just what he aimed to avoid, a strengthening and unification of anti-communist powers. Since his death there has been a progressive spreading of responsibility for formulating policy and the Politburo is now concerned to insure that in future no one person will hold supreme power. There is little indication that Russia has changed her long-term aim of achieving world communism under Russian domination, but she has entered a period of suspended militancy. She wants to consolidate her gains made in the wake of the last war. The West, on the other hand, would like to see a restoration of pre-war boundaries for Russia and a liberation of the Eastern European countries. Russia is following the policy now of trying to reduce tension without loosening her hold on the Eastern European countries and on East Germany. She also reserves to herself the right to spread communism abroad and at Geneva there was no discussion on the Cominform which directs the activities of communist parties abroad. Admittedly, she agreed to withdraw from Austria and she has returned to the Finns the port of Porkala. In Austria she could not now have set up a puppet government because the West would react violently and with Finland neutral Porkala was of little military value to her. Nevertheless the withdrawal from these two places does mark a change in attitude, a relaxation from the habitual stiffness of post-war years. Her industry has made a good recovery from the war and is expanding rapidly. Her economy is sound except in agriculture, in which the collectivisation of farms has not been a success.

The governments of East Germany, Poland, Czechoslovakia, Rumania, Hungary, Bulgaria and Albania are firmly under Soviet control. What happened in East Berlin in 1953 has been a lesson and since then Russian control elsewhere in the Eastern European countries has been tightened. The economy of these countries is being developed as complementary to that of the Soviet economy, the immediate effect of which has been a lowering of the standard of living.

Berlin, in which I spent three days, provides an interesting window on conditions behind the 'iron curtain'. The situation there would be childish and laughable, if it was not at the

same time tragic. Berlin, as a whole, lies in the Russian occupied zone of Germany. The city, in accordance with the Potsdam agreement, is divided into four sectors occupied by Britain, the USA, France and Russia. By agreement free movement is allowed within the city from sector to sector, but the Russians will not permit the Western occupying powers or West Berliners to move from Berlin into the Russian zone without a pass. Often a soldier wanders across the sector-zonal boundary. It is easy enough to do ; if, after a late evening, you fall asleep on the underground railway you get carried across the boundary. When this happens the soldier is arrested and it takes anything from 24 hours to ten days to get him back. There has been much infantile wrangling over the inter-sector boundaries and I was shown a place where a 35-inch strip of ground has been in dispute for over an year. There is a striking contrast between East and West Berlin. West Berlin is prosperous, it has been repaired and rebuilt, it is crowded with cars and the shops are full. In East Berlin, apart from Stalin Allee, a show street, the new Soviet embassy, and the war memorial, little repair has been done. There are very few cars in the streets and those that there are are old. The big co-operative department stores are full of poor quality goods affording little choice for the consumer. The East Germans do not like their government or their conditions in their half of the country and an average of 2000 refugees a week pour across from the Eastern to the Western sectors of Berlin. Here they are collected in camps and are carefully screened before being sent to Western Germany for resettlement.

#### THE NEUTRAL POWERS

Not much need be said about the neutral powers. Finland, Sweden, Austria and Switzerland have democratic governments and their peoples have an abhorrence of the practices of Soviet communism, but in global war they would probably only fight if their territory was invaded. Austria has no army yet and is faced with even more difficult problems than Germany in recreating armed forces. Yugoslavia has a communist form of government but, having asserted her independence from Moscow, is likely to endeavour to remain neutral. Spain has entered into agreements with the USA for the building and

occupation of air bases. She is likely to allow the USA to use these bases in the event of war, even though she is not committed to do so now.

### THE PROBLEM OF GERMANY

Before I pass on to purely military matters, I must touch on the problem of Germany, the most critical, the most contentious problem in the whole of Europe which is bedevilling all progress in the laying of the foundations of peace. More than ten years have elapsed since Germany was defeated and no peace treaty has been made with her as a whole, and she remains split in two. She is virtually still occupied by foreign armies. Germans have two deep-seated aspirations ; firstly to reunite the two parts of Germany and secondly to regain the territory they lost to Poland. They realise that these aspirations are not immediately attainable and that they must wait with patience. Though Germany was utterly defeated in 1945 both the Western European powers and Russia are afraid of the military potential of a reunited Germany. Russia feels she must never allow a reunited Germany to align herself with the West, and the NATO powers, equally, feel they must never allow a reunited Germany to ally herself with Russia. Either of these happenings, they think, would upset the balance and give the other side a tremendous asset in terms of strategy and industrial power. It is my opinion that Germany cannot, for a third time, alone, threaten the peace of the world through military power. She cannot be a first class power on a par with the USA and Russia because she lacks the strategic space, even if she built up thermo-nuclear offensive power. Her chance of dominating the world would seem to have passed. Meanwhile, the Federal Republic of Western Germany is now a genuinely free democratic government. She has become a member of NATO and has undertaken to contribute twelve divisions (four armoured and eight infantry) to NATO forces. She is a party to WEU, by a clause of which she has agreed to allow British, French and US forces to remain on her territory for Defence purposes. The East German government commonly called the DDR, on the other hand, is Russian controlled, though in Russian eyes independent. There are 24 divisions of the Red Army in East

Germany. The DDR is not recognised by West Germany nor by the other NATO powers. This government, besides its vassalage to Russia, is a police state and I have already mentioned that there is a steady stream of refugees from East to West Germany. The new East German army probably has more deserters than any army has ever had in peace time. The majority of East Germans hate their government but are powerless to get rid of it.

No agreement was reached over the reunification of Germany at Geneva and because the Federal government is free while the DDR is not, Russia now has the advantage in that she, but not the West, can offer unity to the German people. She seems just now to be content to let the gravitational pull between the two Germanys act to detach West Germany from NATO and the West. This is unlikely to happen so long as Adenauer is alive but when he goes, the policy of Federal Germany may alter. There is a growing body of German public opinion against the rearming of Western Germany within NATO and in favour of a neutral policy. Indeed as the West will not allow a reunified Germany on the side of Russia and Russia will not allow a reunified Germany on the side of the West, neutrality may be the only state for a reunified Germany acceptable to both sides.

#### THE MILITARY BALANCE OF POWER

That in broad outline is the European background against which we must weigh the opposing military forces.

The military situation is difficult to estimate because it is overshadowed by the imponderables of atomic and thermonuclear weapons. Not much is really known about the effect of these weapons on war. Two small atom bombs were dropped in anger on Nagasaki and Hiroshima at a time when the Japanese were already facing defeat. Only one nation possessed the secret of the bomb at the time. Since then a few more bombs have been exploded in lonely spots of the globe by the USA, the UK and the USSR and a limited study has been made of the physical destruction they cause. What will their effect be on the morale of a nation, on the will or ability to continue the struggle and what will be the long and short term effects

of radio-active fallout? — these questions admit of no certain answer yet. Military thought on the impact of nuclear weapons on warfare is in a state of flux and there is little sign of any crystallisation in expert opinion yet.

At present the advantage in nuclear weapons is with the West. Not only are their stockpiles of bombs larger but they have a better ability to deliver them to enemy targets. In General Le May's SAC the USA has the most powerful offensive weapon ever created by a country — a force of about a thousand bombers in a constant state of readiness, capable of flying at 600 mph, and because of in-flight refuelling, able to deliver nuclear bombs, with the necessary accuracy, on any target in Russia. The bases of this bomber force are well protected, lying mainly in the Southern USA out of range of Russian bombers except for one-way suicide missions by their heaviest types. In addition the Western allies have a ring of air bases surrounding Russia. These are well dispersed and would be difficult to knock out simultaneously. The US Sixth and Seventh fleets, respectively in the Mediterranean and the Pacific also possess nuclear capability for both strategic bombing or for support of ground forces. The British V-bomber force will come into operation this year and will be a useful supplement to SAC. Curiously the Russians have not, as far as is known, evolved a technique for in-flight refuelling, and they do not possess an air tanker fleet. They have developed new heavy jet bombers with surprising quickness and appear to be closing the gap in air striking power between themselves and the USA. Within five years they are likely to possess bombers that can reach the remotest parts of Texas and return to their home bases.

As to air defence, here too the advantage appears to be with the West, who have a better C and R system. In 'Nike' the USA has developed a surface to air guided weapon for anti-aircraft defence. It has an effective range of 75 miles. It is recognised, however, that no defence can give complete protection and with thermo-nuclear weapons a few hits or near misses can spell disaster for national life. In civil defence to which public morale is closely related, the West is ahead in so much as the Russians believe it is a waste of time and money to organise civil defence. Of course, they stand less in need of

it because their population and industry are better dispersed, their economy is less complex and their communications less vulnerable, but the lack of it may create an adverse psychological impression in the population.

The most desperate race now in progress in the realm of weapons is for the development of an inter-continental ballistic missile with a thermo-nuclear warhead. The side that first produces this push-button weapon in numbers will possess a match-winning advantage, because the scientists are unable to see any possibility yet of defence against them. There is not much hope of success in counter-attack or preventive war with bomber-delivered weapons because launching sites would be difficult to find and hit. Prototypes of ballistic missiles with ranges of 400 miles have been made and according to conservative opinion among defence scientists it will be another 10 to 15 years before the inter-continental missile is developed.

#### GROUND FORCES

It was the threat of the Red Army in Europe which made the Western European and North American powers subordinate their rivalries and unite to create a common defence. Since the signing of the North Atlantic Pact, they have, by the creation of NATO, brought the Russians to a reasonable frame of mind. The best testimonial of NATO is the fact that the Russians hate it. They have made determined efforts to get it dissolved and to prevent Western Germany from becoming a member. It is outside the scope of this article to describe the organisation of NATO and I will confine myself to making a few general remarks on the opposing ground forces in Europe. The advantage of power in conventional forces lies with the Russians. They are stronger numerically and have unified and homogeneous forces under centralised control. The machinery for the supreme political and military direction of those forces is simple and, therefore, capable of swift decision. The morale and the equipment of the Red Army are good. The NATO powers between them have eighteen divisions in Western Germany and opposed to them over the inter-zonal border are twenty-four Red Army divisions, but—and this is the crucial difference—the Red Army in Eastern Germany can be quickly reinforced to sixty

divisions from Eastern Russia whereas the NATO powers do not have any substantial forces in being that can be sent as immediate reinforcements. I do not wish to belittle the value of NATO. Its achievements are considerable, and as far as the build up of infra-structure goes, they are remarkable—for example, over 150 jet airfields have been built, 4,000 miles of fuel pipelines have been laid and communications have been so improved that SHAPE can get in telephonic touch with subordinate headquarters at Oslo or Naples in a matter of minutes. But NATO suffers from disadvantages arising from the very nature of the organisation. Supreme political control is vested in the NATO Council, consisting of foreign ministers to whom their governments have delegated limited powers. The council meets once or twice a year and its decisions have to be unanimous to be carried. This system would be unworkable in war and no agreement has been made or even attempted as to what the war control would be. Each nation has assigned only a proportion of her forces to NATO, others are earmarked for NATO in the event of war, whereas the bulk is reserved for national control. All NATO troops, except those of the USA and Canada, are conscripts who have varying periods of national service never more than two years. The turnover of men in units is rapid with a consequent drop in efficiency and morale. NATO armies are a collection of heterogeneous national forces each with its own logistic system. They lack cohesion and central direction. My impression was that NATO provided an impressive facade but would have to be drastically changed to stand up to the test of war. It is a tragedy perhaps that the Russian threat was never so great as to compel the Western democracies into a closer union with a federal government to deal with defence and other matters of common interest. With the forces at his command at present SACEUR is obliged to plan to withdraw to the River Rhine for his first defensive stand. Schlesweigh-Holstein which guards the approach to Denmark, and much of Western Germany would have to be surrendered to the enemy. When Western Germany is able to contribute twelve divisions, he will be able to change to a forward strategy based on the line of the River Elbe. That is why the West German contribution is regarded to be so important. However, a ten year hiatus in the military life of a nation cannot be repair-



ed quickly and it will be at least four years before the German divisions are ready.

#### NAVAL FORCES

Since the end of World War II Russia has emerged as a great naval power and her fleet is second in strength to that of the USA. Its composition is perplexing consisting mainly of a submarine fleet—a fleet larger than that of Germany at her peak strength—and of cruisers of the 'Sverdlov' class. There are no aircraft carriers. There can be little doubt as to the role of the submarines but what the cruisers are intended for is obscure. Our information does not indicate that either submarines or cruisers are fitted with weapons capable of firing nuclear missiles. Russia's geography is a tremendous handicap to her in exercising sea power. The exits to both the Baltic and Black seas are in the hands of NATO powers. Her Far Eastern and Northern fleets are widely separated, the short Northern route between them being open only from 3 to 4 months in the year. Her navy is thus split up into four parts virtually isolated from each other. Both flexibility and concentration are denied to her fleet. On the other side both Britain and the USA are great maritime powers with a world-wide network of bases. If naval forces play a significant part in the next war, the West possesses an initial advantage that would give her eventual freedom of the seas.

#### SUMMING-UP ON RELATIVE STRENGTH

To sum up on relative strength, the West at present has an overwhelming advantage in nuclear weapons and the means of delivering them, while Russia has the advantage in conventional forces and with them could probably overrun Europe in 3 months provided no nuclear weapons were used against her.

#### COURSES OPEN TO THE WEST

This situation faces the West with a difficult decision to make. If Russia committed aggression in Europe with conventional forces only, there would be three possible methods for the West to fight Russia :—

- (a) She could strike at once with nuclear weapons at the

heart of Russia, while fighting a defensive battle in Europe.

- (b) She could fight with conventional weapons only. She would be on the defensive initially but would hope to be able to gain time to mobilise her full strength.
- (c) She could fight with the use of nuclear weapons limited to tactical and purely military targets. There would always be the threat of the all-out use of nuclear weapons if Russia did not observe the same restrictions.

Course (a) can well be ruled out because neither Parliament nor Congress would first authorise the unleashing of an all-out nuclear war. Even if the West were confident of getting the better of it, the cost to them in lives and material and moral loss rules it out as a course to be deliberately chosen. Course (b) can equally be ruled out because the West would be at a severe disadvantage. It is probable that Russia would quickly gain command of the whole of Europe. Both the USA and Britain regard Western Europe as ground vital to their defence. If it was lost it is unlikely that they could again launch an operation to recapture it; at best the war would end in stalemate.

Increasingly course (c) seems to provide a possible answer. It is thought that if the West made a limited use of nuclear weapons, Russia would observe the same limitations as she is at a disadvantage in strategic air striking power, but she would do this on the proviso that she was not pressed so hard as to be facing defeat. Faced with defeat she might well act desperately. The aim of such a war would be, not unconditional surrender, but a restoration of the status quo. The guiding principle governing both sides would be that at all costs global nuclear war is to be avoided.

#### CONCLUSIONS

From this review of the situation I think one must conclude that global war is unlikely in the near future. It could break out by accident or miscalculation, but because it is so obviously an unprofitable venture it would not be taken up

deliberately as an instrument of policy. Nuclear bombs are a deterrent to war, a deterrent to both sides even to the one that has an advantage over the other. As with the ancient Jehovah, "a fear of the Lord was the beginning of wisdom", so now the fear of atomic power may curb the ambitions of the great nation states.

It is my opinion that the likelihood of limited wars too has receded. There have been several limited wars since 1945, Indo-China, Kashmir, Palestine and Korea. The two opposing blocs were not involved directly, but were interested. In the world we live in, the two opposing giants are likely to be drawn in on opposite sides in any dispute. All these limited wars have ended inconclusively in truce agreements. The reason for this is that the great powers saw clearly that if carried to their conclusion, the danger was that these wars would become unlimited, involving the whole world. If either side suffered a reverse, it would put more into the struggle and inflict a reverse on the other side, which in turn would pull out the next weapon from its armoury. This process would go on till everything was put into the struggle, which would mean global war. The great powers did not want a global war, so truce agreements were patched up. I think the lesson of these wars has been drawn by both big and small nations. No nation will resort to war knowing that it is unlikely to achieve its aim, that the war will either end inconclusively or the whole world structure will come tumbling down upon its head.

There exists a precarious equilibrium of power between East and West. Barring accidents, this is likely to be maintained without violent upset, but inter-bloc rivalries will manifest themselves in the cold war which will be prosecuted with unabated energy. The unaligned countries, who, in a degree possess the power to hold the scale in balance, will be a particular target in this war, as is borne out already by the trend of events. These countries will have to remain on their guard and act circumspectly if they are to retain their independence and their faith in freedom.

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## DIEN BIEN PHU

MAJOR E. O'BALLANCE

THE loss of Dien Bien Phu in the Spring of 1954, although a glorious military epic in itself, was a severe blow to the French and did much to compromise their position immediately afterwards, when they were negotiating for a Cease-Fire Agreement. As is well known the political implications were terrific. But considering things from a strictly military point of view, perhaps an account of what actually happened, together with a few remarks, may be of interest.

### THE GENERAL SITUATION IN INDO-CHINA

For nearly seven years the French had been fighting a protracted battle against the Viet Minh in Indo-China, without having much success. They had many handicaps, but in spite of a build-up of armed forces there, the French military position gradually declined. For a brief spell, under the able leadership of Marshal de Lattre de Tassigny, their fortunes improved somewhat, but again, after his death, depression and a deterioration of morale set in.

In May 1953 General Navarre arrived to take over as the Commander-in-Chief in Indo-China, and he set to work energetically. The main deduction he made from his appreciation was that it would take him at least two years to win this war, and in making that statement, he said that he was relying on the new Viet Nameese National Army, which was in the process of formation and training, to take over a large share of the fighting in the Autumn of 1954.

### THE OPPOSING FORCES

The bulk of the French-Viet Nameese Forces in this theatre were grouped in the Red River Delta in Tongking, which was a rich, thickly populated rice bowl, in fact the main prize of the

war, towards which the Viet Minh had long cast envious eyes, but as yet had not been sufficiently strong to make a determined attempt to take. Although the Delta area was heavily garrisoned and fortified, French control was often only nominal in parts as in places the Viet Minh had managed to infiltrate and establish themselves, so the security of this 'firm base' gave some cause for uneasiness at times. In all, the French and Viet Nameese had about 400,000 troops available, of whom only about 95,000 were European.

On the other hand, it was hard to ascertain with any degree of accuracy the exact number of Viet Minh troops there were fighting against them, but it was estimated that General Giap, the Commander, had the equivalent of at least eight divisions under his control. Nearly all these Viet Minh divisions were either in or adjacent to the Delta, and it was to distract attention from this area, that General Navarre decided to establish Dien Bien Phu as another strong 'resistance centre', far removed from Hanoi, the core of the French defences.

To clarify the two very similar expressions, "Viet Nam" is a country, being the new name for the combined States of Tongking, Annam and Cochin-China, which was sponsored by France, while "Viet Minh" was more of a political creed, being largely Communistic in its outlook and sympathy. It was against the "Viet Minh", or rebels, that the French had been struggling for so long.

#### THE POSITION OF DIEN BIEN PHU

Dien Bien Phu was in northern Viet Nam, in Tongking, about 130 miles west from Hanoi, being only 10 miles from the frontier of Laos. It had no particular strategic significance other than being in the hill country, but was the junction of three roads in that area. However, it was the centre of a fertile opium growing district, from which source the Viet Minh gained large revenues. Also, it was from here that the Viet Minh had launched their offensive into Laos, in the Spring of 1953.

Dien Bien Phu itself was on the Noua River and was set in the middle of a flat 'basin' of paddy fields, measuring about

three and a half miles by five, surrounded by low, but steepish, jungle covered hills, which, of course, completely overlooked it. To the north, between Dien Bien Phu and the Chinese Frontier, was Lai-Chau, another isolated French 'resistance centre', which although it had to be maintained and supplied by air, blocked that Viet Minh supply route from China.

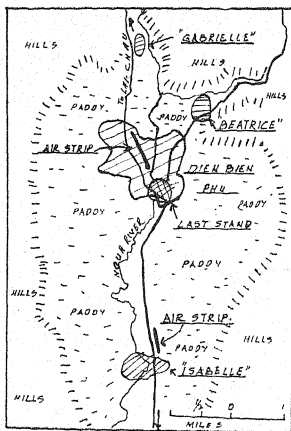
#### THE BUILD-UP

On the 20th November 1953, French and Viet Nameese paratroops were dropped, and with very little serious fighting they managed to make good their occupation of Dien Bien Phu. At once they got on with the repairing of the two airstrips, and the garrison was quickly built up. A number of field guns were flown in, as well as a few light tanks, which came in by sections and were assembled by the garrison.

General Navarre considered that Dien Bien Phu was the only suitable place, away from the Red River Delta, in this direction, which offered sufficient space for a full sized airstrip, surrounded immediately by fairly open country. He estimated that the very size of the open space, which had a circumference of perhaps fifteen miles or so, meant that it would require a large enemy force of at least thirty battalions to invest it. The stated official objects of its re-occupation were to re-establish French control in a traditionally friendly part of the country, to rally the Thai Tribes and put them on a self-supporting basis, and to cut the supply route from China. Also, it was designed to be a jumping off base for further operations and a challenge to the Viet Minh formations poised to strike at Laos.

#### THE DEFENSIVE LAY-OUT

The defensive lay-out consisted of a number of Defended Localities and Areas, grouped around, and protecting, the main airstrip, each of which was based on a suitable piece of ground and was surrounded by a pattern of supporting trenches, outposts and automatic weapon positions. The Fire Plan, both of small arms and artillery, was carefully tied up, and each of these Defended Localities mutually supported the others.

DIEN BIEN PHU

DEFENDED  
AREAS

SHOWING FRENCH POSITIONS.

BEFORE THE SIEGE

FEBRUARY 1954

The main Defended Areas, where the Commander, Colonel de Castries, made his headquarters, were bunched together to the south of the main airstrip, which incidentally was 1,600 yards long and ran from north-west to south-east. The outer perimeter defences were linked up and the whole was surrounded by wire which was covered by fire. Digging went on and in a short time the entrenched camp, or 'resistance centre', developed into a very strong position indeed.

In addition, there were three Defended Areas outside the perimeter, away from the main position, each covering one of the three roads that led into Dien Bien Phu. To the south was "Gabrielle", just over a mile from the main position, covering the road from Lai-Chau. To the north-west was "Beatrice", covering the road to the Delta, which was about three-quarters of a mile from the main perimeter, while to the south, three miles away, was "Isabelle", the strongest of the three. Each of these three outlying positions had field artillery sited so as to catch in enfilade any enemy attacking Dien Bien Phu itself.

As a matter of interest, most of the Defended Areas and Localities that went to make up the main position, had names given to them, but to enumerate them in detail would only tend to confuse, especially as once the battle was joined, in the subsequent re-organisations, they became merged into a blob and most of them soon lost their separate identity.

#### THE OPENING MOVES

On the 11th December 1954, Lai-Chau, the 'resistance centre' to the north, was evacuated, the reasons given being the inadequacy of its airstrip and the steepness of the surrounding hills. It had obviously been decided to put more eggs into one basket, and to concentrate resources at Dien Bien Phu.

The bait worked, and as soon as the new French 'resistance centre' was set up, three Viet Minh Regular Divisions started moving towards it from the Delta area, and by the second week in December the leading one, the 316 Division, was beginning to close in around the camp. As it was thought that an attack was imminent, French supplies and reinforcements poured



in, the garrison being brought up to a strength of thirteen battalions, most of which were either Paratroop Units or Foreign Legion. By the beginning of January 1954, there were three Regular Infantry and one Artillery Division in the hills surrounding Dien Bien Phu, which so far were still careful to keep out of French artillery range. It was estimated that General Giap had about 30,000 men around the entrenched camp, whilst inside there were about 12,000.

#### THE FIRST BLOOD

On the 12th January there was a short, sharp clash to the south of the town in which the French Air Force intervened, causing the Viet Minh to withdraw, leaving eleven dead behind on the field. But generally, the enemy contented themselves with merely ambushing patrols that ventured too far.

#### RECESS

By the end of January it was confirmed that the Viet Minh 308th Division, one of the investing formations, had been detached to make an incursion into Laos. Taking advantage of this, a 'recce in strength' was made by the garrison northwards along the road to Lai-Chau. This force made little contact with the enemy but came across evidence of abandoned trenches and weapon pits. However, it ran into sporadic artillery fire when about six miles away from the main camp.

On the 9th February, a similar recce force went out along the road to the north-east, but was turned back by enemy fire when only about three miles from Dien Bien Phu. On the 11th February, another larger recce patrol ran into fire about three miles to the east and had to return. After this the French Air Force came more into the picture, the aircraft concentrating on pin-pointing and attacking the Viet Minh positions in the hills around the camp. The remainder of the month was fairly quiet, there being a certain amount of French patrolling, which generally ran into trouble between three and six miles from the 'resistance centre'.

#### GENERAL NAVARRE'S APPRECIATION

This brings us to the beginning of March 1954, by which time General Navarre was of the opinion that he had been at

least partially successful in his aim, which was to draw off enemy forces threatening the Red River Delta. When the awaited attack on Dien Bien Phu did not come, he deduced that General Giap's object was to prevent the garrison from operating elsewhere, and he probably considered that the task of the Viet Minh troops was merely to contain the 'resistance centre'. He correctly forecast that a part of this Force would be detached to swoop southwards into Laos to seize the valuable opium harvest when it was ready, as had been done the previous year. However, General Navarre continued to reinforce the garrison, saying that it would soon be in a position to send out strong mobile patrols to harass any Viet Minh forces attempting to by-pass that area.

In view of its disposition, it was suggested that a number of posts or picquets be established in some of the surrounding hills to act as a protective screen and also to enfilade any enemy attacks across the open ground. But this was vetoed by General Navarre who appeared to be confident that a major attack would not be mounted as he considered it unlikely that General Giap would risk so many of his all too few Regular soldiers in another set-piece battle. Regular soldiers were General Giap's most prized possessions as they were practically irreplaceable.

To date, in the Indo-China War, the only set-piece attack that the Viet Minh had put in against the French had been that at Na-Sem, at the end of 1952, which had failed. Although it was clear that the French had not fully appreciated by what a narrow margin, and for what reasons. Since then, General Giap had avoided mounting any conventional, large-scale attacks, which gave the French a rather erroneous impression of his capabilities and intentions.

As regards the actual project of setting up a 'resistance centre' at Dien Bien Phu, there was some difference of opinion between General Navarre, whose idea it was, and Lieut.-General Cogne, the Commander in Northern Indo-China, who thought that first of all full control should be regained in the Delta and French authority firmly established there. The Red River Delta was the main source of both funds and recruits for the Viet Minh,

but General Navarre wanted quicker and more spectacular results, and as he was the Commander-in-Chief, his plan was carried out.

#### COURSES OPEN TO THE VIET MINH COMMANDER

By the first week in March, it was clear that the Viet Minh 308th Division was returning to Dien Bien Phu from its operations in Laos, and the situation suddenly became tense as two obvious courses were open to General Giap. Firstly, he could now mount a set-piece attack on Dien Bien Phu, and secondly, having obtained the maximum amount of French dispersion, he could hit straight at the heart of the Delta. Both these disturbing probabilities had never been seriously considered by the French Command. Now they were forcibly brought face to face with them, and suddenly everyone became uneasily aware of the fact that almost overnight the Viet Minh rebel guerillas had developed into an efficient, conventional army, capable of undertaking field operations.

#### THE PHASES OF THE SIEGE AND FALL

With that introductory background before us we now come to the account of the Siege and Fall of Dien Bien Phu, which for clarity and study, can be conveniently divided into four phases, as follows:

1. The initial attack on the 13th March;
2. The Second Main Attack which began on the 30th March;
3. The period of encroachment; and
4. The Final Attack.

#### THE FIRST PHASE

Dealing with the First Phase, by the 10th March, the 308th Division had returned from Laos, and on that day the main air-strip was shelled by enemy 75mm guns for the first time. During the previous two or three days, the ring around the 'resistance centre' had visibly tightened and the opposing lines were now on an average of only two miles apart. The Viet Minh dug in as they advanced.

In the early morning of the 11th March, there was an engagement between the defenders and two Viet Minh units which had penetrated the outer perimeter wire and dug themselves in just inside it during the night. French Light Tanks took part in the counter-attack, and the enemy were successfully ejected from their hastily improvised defences, leaving 58 dead behind them.

Later that day, French aircraft dropped napalm on Viet Minh gun emplacements in the hills. It had become apparent that General Giap had an unexpectedly large number of 37mm anti-aircraft guns, as well as a surprisingly large quantity of field guns mustered there. Also recon aircraft confirmed that supplies were coming down from the Chinese Border in increasing volume. The 12th and 13th were comparatively quiet, action being confined to shelling by both sides and some patrolling.

### **The Initial Attack Launched**

It was towards dusk on the 13th March that the initial attack was launched. After an hour's heavy artillery bombardment the Viet Minh began their assault. Everywhere massed infantry advanced in the now familiar Communistic pattern, under the cover of an intense artillery concentration. The main weight was directed against "Gabrielle" and "Beatrice", while elsewhere their attack was more in the nature of a general probing and harassing movement.

The fighting around "Beatrice", on the road to the north-east, was particularly fierce, and the enemy put in five separate attacks on this feature. By 10 o'clock they had gained a foothold by seizing two of the Defended Localities of the position, from which they launched their fifth attack. This succeeded in completely overrunning the French position, and by midnight "Beatrice" was in Viet Minh hands. It had been literally swamped with manpower and enemy corpses were strung thick along the wire, masking and deadening the fire of the defenders.

### **The Attack Resumed**

To the north, the first attack on "Gabrielle" was repulsed, after which there was a lull while the enemy regrouped. At

about three o'clock in the morning, another attempt was made, again with massed infantry supported by artillery fire, but even though hard pressed, the defenders of "Gabrielle" managed to fight off the Viet Minh troops. To the south, in the first main general attack, an attempt had been made to take "Isabelle". This was repulsed, after which this position was not again seriously assaulted in this Phase, although it was subjected to harassing tactics generally.

On the morning of the next day, the 14th, both sides mutually observed a truce to enable them to collect their dead and wounded. This was the first time that such a thing had happened in this war in Indo-China. During the day, to stiffen the garrison, a Paratroop Battalion was dropped in on Dien Bien Phu, and other supplies and reinforcements were landed although the airstrip was under spasmodic artillery fire.

Towards evening, after another heavy preliminary artillery bombardment, the Viet Minh offensive was renewed, and although action flared up all along the line, the main assault was on "Gabrielle". Throughout the night there was desperate fighting, and again by sheer weight of numbers and a total disregard of casualties, the Viet Minh succeeded in taking some of the Defended Localities, but the French still held grimly on to part of the position.

### **The End of the First Phase**

At dawn on the 15th, a French counter-attack was launched from the main position, supported by their Light Tanks, to try and restore the situation on "Gabrielle", but they found it to be so badly battered that the survivors were brought back, and the Defended Area was abandoned. Thus ended the First Phase, and the Viet Minh paused to consolidate their gains.

The Viet Minh artillery continued to fire from concealed positions in the hills on to the entrenched camp and the airstrip, which by now was out of action, all supplies having to be parachuted in. French bombers and fighter-bombers made continual attacks on these enemy positions with both H.E. and napalm. The aircraft casualties were heavy owing to the unforeseen appearance of so many anti-aircraft guns, at least twelve French

aircraft being destroyed between the 11th and the 15th March, of which five were Dakotas.

### *Comments on the First Phase*

Commenting on this First Phase, the two outer bastions, "Gabrielle" and "Beatrice" had fallen, but the main defences were still intact, and the assault on "Isabelle" had been repulsed. The Viet Minh had closed in around Dien Bien Phu and were occupying trenches, on the average, only about a mile from those of the French. They had been held at bay, rather than beaten off. The four attacking Viet Minh Divisions were Regular ones, and although there is no accurate estimate, their casualties must have been extremely heavy, as in their attacks, wave after wave of solid infantry had advanced into the French small arms fire, so the ground gained had been won at a heavy cost.

Undoubtedly the situation was tense, but there was no undue cause for alarm ; in fact on the whole the French seemed to be rather glad that General Giap had essayed another frontal attack, in which he had received a bloody nose. The general opinion was that he would now think twice before risking more of his precious regular soldiers in conventional battles, especially on ground of General Navarre's choosing. Accordingly, morale was high in Dien Bien Phu.

However, the French Intelligence had little cause to congratulate themselves, as the number of field guns, their accuracy and their powerful concentrations, came as a surprise, as did the fact that the Viet Minh were also well supplied with 37mm anti-aircraft guns, which they put to such good use.

### THE SECOND PHASE

To continue with the narrative, during the next few days the enemy did not press the attack, but they were seen to be re-grouping to the north and to the east of Dien Bien Phu. On the 16th March, another Paratroop battalion was dropped in on the garrison, together with a quantity of ammunition and other stores, but the Viet Minh anti-aircraft fire was fairly intense, and although the operation was considered to be successful, there were some casualties.

However, in return, the Viet Minh positions were heavily attacked, and a fierce duel developed between the French aircraft and the Viet Minh anti-aircraft guns. The enemy were constantly moving their gun positions and in spite of the concentrated air activity, there was little sign of any appreciable proportion of them being put out of action.

### **The Air-strip Out of Action**

On the afternoon of the 17th, a Dakota managed to land on the airstrip, but although large Red Crosses were displayed, as soon as some boxes of medical stores were unloaded, the Viet Minh, perhaps under the impression that they contained ammunition, commenced shelling again, causing the aircraft hastily to take off, with only a few walking wounded on board. A second Dakota was unable to land owing to the shelling, and had to return to Hanoi. The next morning yet another tried to land, but had to take off again almost straight away, as the enemy had the whole airstrip covered by mortar and artillery fire. But in the afternoon a helicopter did manage to land and take off a few wounded.

With the airstrips out of action, all available aircraft were mobilised to drop supplies and to attack the Viet Minh positions. These included Bearcat fighters, B.26 Bombers, Privateers of the Naval Air Force, and Helldivers from the Aircraft Carrier "Arromanches". Even Dakotas were pressed into service to scatter cans of napalm over enemy positions. In addition, aircraft of General Channault's Chinese Air Transport Company, flown by American pilots, joined in the task of flying in supplies, but to avoid the stigma of direct participation they did not carry paratroops. These aircraft were on charter to the French and had previously been employed on trooping duties outside the battle areas. Helicopters, of which there were ten, came into full operation, each carrying six wounded and making two trips per day.

### **The Viet Minh Sap Forward**

No major attack was mounted but the enemy were very busy in other ways, chiefly 'sapping' their way forward. By night they came out and dug trenches near the French perimeter,

which by day the defenders made valiant efforts to fill in again, but not always with success, owing to the concentration and accuracy of the Viet Minh artillery fire. In this manner the enemy crept steadily nearer and the scene became reminiscent of Flanders in the First World War. In some places the opposing trenches were less than half a mile apart, although in others French patrols could still advance for over a mile or more before meeting resistance.

### **The French Become More Active**

On the 21st March, the French made a sortie, supported by their tanks, making contact with the enemy to the south. About the same time it was reported that Viet Minh pressure on the eastern side of the perimeter had relaxed. The next day there was a clash in the course of the daily liaison patrols between the main position and "Isabelle", the Viet Minh opening fire from concealed positions just as the two French patrols made contact. There was some fighting and tanks quickly came to the aid of the French, and the enemy were driven off, leaving behind them 175 dead. That evening a Dakota succeeded in taking off some wounded, but a second aircraft was unable to land.

During the next two days the French intensified their air offensive, adopting 'obliteration' tactics, which consisted of formations of 12 to 14 aircraft concentrating on individual positions. Air attacks were made on Viet Minh Forces which were seen to be grouping to the north and to the north-west, on the road to the north along which supplies were being brought in from China. On one day over 10,000 gallons of napalm were dropped on Viet Minh positions.

### **A Lull**

By the 26th March, the enemy bombardment had slowed down and their 105mm guns were silent for the first time. The next two or three days were also quiet and the French Command were of the opinion that their intensive air offensive had been successful and had prevented a second, all-out Viet Minh assault. The rains were due at the beginning of May, and it was thought that General Giap would postpone any major attack until after



that date when the weather would considerably restrict air intervention or that he would be content to try and stifle the garrison by sapping.

On the 28th March, a small French Force, supported by the overworked tanks, attacked a small enemy-held village, about two miles to the west of the main position, which dominated the airstrip and prevented aircraft using it. Two days previously this village had been heavily attacked from the air, and as things were fairly quiet generally, the Commander considered it to be an opportune moment to destroy this position. He managed to encircle it and to inflict casualties on the enemy holding it but he was unable to overrun it completely, although he did manage to capture a few anti-aircraft guns.

### **The Second Main Assault**

So far these small actions were only the preliminary to the Second Phase, which was the second main assault. This began on the afternoon of the 30th March and lasted until the morning of the 4th April. At about 4-30 p.m. on the 30th March, the Viet Minh launched an infantry attack from the eastern side, taking full advantage of the network of trenches that they had dug during the previous fortnight which enabled them to approach under cover to within two or three hundred yards of the perimeter wire. They succeeded in penetrating the French defences at several points, but counter-attacks during the night pushed them out again except from part of a north-eastern Defended Locality, which the Viet Minh had overrun.

The next morning, the troops from "Isabelle", which had not been attacked, launched a diversionary assault which hit the Viet Minh in between the two French positions, where fighting went on for some hours. During the day, a counter-attack was begun against the north-east Defended Locality, which consisted of three Forward Defended Localities, and had been taken by the enemy the previous evening. Two of these Forward Defended Localities were re-taken, but the Viet Minh brought down the full weight of their heavy mortars, causing the French to withdraw again.

After dark on the 31st March, the Viet Minh artillery bombardment was resumed and was followed by another

infantry attack on the east side of Dien Bien Phu. There was desperate fighting in this sector, but after about an hour the enemy called off the attack and contented themselves with shelling for the remainder of the night.

### **French Counter-Attacks**

On the 1st April, there was much fighting around the north-eastern Defended Locality, but in spite of several counter-attacks the French could not dislodge the Viet Minh, who had become firmly established there. At the same time the enemy assaulted the north-western Defended Locality, which covered the airstrip, and after some fighting overran it, actually penetrating on to the edge of the airstrip to occupy a corner of it.

The next day, the French put in some successful counter-attacks in this area, but they found the position to be so badly damaged that they decided to abandon it. In spite of several tries they were unable to clear the enemy from the corner of the airstrip. Also, throughout the day there was sporadic fighting around the north-eastern Defended Locality. During the night the Viet Minh launched an infantry attack against "Isabelle", which was broken up by accurate artillery fire.

### **Renewed Viet Minh Activity**

On the 3rd April, there was activity in all sectors, but the main weight of the assault fell on "Isabelle", where the attack lasted from 7 p.m. until midnight, after which the Viet Minh withdrew, leaving over 200 dead strung on the barbed wire. The enemy also concentrated on the north-west sector of the perimeter and towards evening launched a mass infantry attack, in the course of which some of his smaller units succeeded in reaching the airstrip. In the night the French counter-attacked and recovered much of the lost ground, but not all.

### **The End of the Second Phase**

By 10 a.m. on the morning of the 4th April, more ground had been recovered, but they were still not able to drive the enemy from the corner of the airstrip. After this, Viet Minh pressure slackened and their investing forces on the south-east fell back a few hundred yards. Later in the day, those on the

north-west and the north-east did likewise, and so comes to an end the Second Phase of the fighting.

### *Comments on the Second Phase*

In this second main attack, General Giap had concentrated mainly on the north-east and the north-west positions which covered the airstrip, and the battle, which had lasted four days and five nights, had been a continuous pattern of Viet Minh infantry assaults on to the barbed wire and French counter-attacks, in which there was desperate hand-to-hand fighting. Throughout, there had been air intervention with both H.E. and napalm.

The French counter-attacks had been both vigorous and aggressive and spoke well for the morale of the defenders, but sheer weight of numbers was against them, and by a complete disregard of casualties the Viet Minh had maintained a gradual penetration of the defences, especially on the north-east and the north-west. Some positions had changed hands as many as twenty times.

### THE THIRD PHASE

Now we come to the Third Phase of the Siege, which was a period of encroachment, lasting from the 5th April until the 1st May. The scene had now come to look more than ever like a battle sector in Flanders in the First World War, with miles of zig-zagging trenches and with both the attackers and the defenders living underground.

After the second main attack, there were a few quiet days and the French made good use of them to repair their defences and to re-organise their positions. On the 7th, another Paratroop battalion was dropped in to reinforce the garrison.

On the morning of the 10th April, the defenders launched an attack on some positions to the north-east that had been overrun on the 30th March. This was supported by tanks and artillery and had some success, and they managed to hold on to what they had re-taken all that day and throughout the night, in spite of heavy Viet Minh counter-attacks. 300 enemy dead had been counted in the trenches after the initial French

attack. On the evening of the 11th, the Viet Minh again counter-attacked and managed to penetrate in several places but the French continued to fight on in small groups, remaining where they were, until in turn a heavy French counter-attack drove the Viet Minh back again.

### **The French Contract**

On the morning of the 18th, the French abandoned some positions near the northern end of the airstrip, and the Viet Minh stepped straight into them and immediately began digging trenches which went into the runway itself. This restricted the dropping zone even further, although both supplies and volunteers were still parachuted in more or less successfully. By this time the figure of 23 aircraft lost was semi-officially confirmed, and it was painfully obvious that the Viet Minh had trained men operating both radar and their anti-aircraft guns.

### **Viet Minh Sapping Continued**

On all sides the enemy dug their way closer and in many places there was only about 300 yards between the opposing lines of trenches. Patrol actions were frequent, and the French made repeated attempts to fill in trenches that the Viet Minh dug during the night. By this sapping, the enemy hold on the airstrip increased, causing the Commander (who had been promoted to the rank of Brigadier-General) again to re-organise his defences. This time they formed a rough circle, about a mile, or slightly more, in diameter, containing the main camp and including only about half the airstrip. "Isabelle" had been comparatively immune from infantry attacks, although it was now firmly ringed by enemy trenches. On the 20th, its garrison attempted a sortie, but this met with little success.

The Viet Minh still concentrated on the airstrip, and soon the French were compelled to abandon their positions that covered the southern half of it, after being outflanked by a sapping movement which cut these positions off from the main body. This brought the enemy to within less than 300 yards of the Command Post, and the dropping zone was reduced to a bare minimum. It was no longer possible to drop in volunteers, and stores were parachuted in with difficulty.

### A Sea of Mud

The rains were early and by the 22nd April, what had been a 'dust bowl' was churned into a sea of mud and swamp. The French Air Force continued to give what support it could, but bad weather considerably hampered activities. The defenders persisted with their counter-attacks all along the line, but space was now too restricted for tanks to be used in their support. Throughout this period, the artillery of both sides had been very active. And so we come to the 1st May, when the situation was that the opposing trenches, in some places, were as close as a hundred yards to each other.

#### *Comments on the Third Phase*

During this Phase, there had been no large-scale actions, as the enemy had followed a policy of steady encroachment, mainly by sapping and by putting in small attacks at selected points. By virtue of overwhelming numbers, he had been fairly successful. There had, of course, been numerous skirmishes and patrol actions, resulting mostly from French attempts to fill in the enemy trenches. The rains had restricted French air activity and had turned the battlefield into a sea of mud. The airstrip was out of action and the dropping zone had been compressed into an extremely small space.

General Navarre hoped that the monsoon would help him by washing out the Viet Minh supply routes and thus curtail their supply of artillery ammunition thereby allowing the French to use the airstrip, or part of it, again. But there was no sign of this happening and the hopelessness of the position began to become apparent. The garrison of, by now, 15,000 first class troops was securely locked up, and the prospect of either a mass break-out or of being able to reinforce Dien Bien Phu sufficiently to make it really secure was not good.

#### THE VIET MINH COMMANDER'S ALTERNATIVE

General Giap had two alternatives. One was to continue his 'nibbling' tactics, using small units of his best troops to make small gains all along the fronts, while the other was to launch another all-out attack. He chose the latter course, and

the Fourth Phase is the final Viet Minh attack on Dien Bien Phu.

#### THE FOURTH AND FINAL PHASE

The grand assault began on the evening of 1st May at all points along the line. This time there was no preliminary artillery barrage, perhaps because the Viet Minh were so close, but the infantry came forward in mass, a thing they had not done for the previous four weeks. Wire was blown up and much of the fighting was done with the bayonet and with hand grenades. By dawn the next morning, the Viet Minh had secured three gains, one on the east, one on the west, and had overrun a Forward Defended Locality on "Isabelle". Other points had fallen during the night, but French counter-attacks had re-taken them.

Throughout the day, the fighting continued on a similar pattern, but it slackened off towards the evening, when the enemy concentrated on a heavy mortar bombardment. On the 3rd, more mass infantry attacks were launched, this time the weight being against the south-west sector and along the west side of the perimeter, where the Viet Minh had some success, and French counter-attacks failed to dislodge them. "Isabelle" was also subjected to heavy fire.

Aircraft assisted as much as possible, and supplies continued to be dropped in, although a quantity fell into enemy hands. On the 3rd, 150 volunteers had been parachuted in, the first reinforcements for some days — and the last. The French regarded these attacks as just a stepping up of the enemy encroachment tactics, and did not fully appreciate that this was General Giap's 'Command Performance'.

#### Mass Infantry Attacks

During the next three days there were mass infantry attacks, alternated with pauses, in which heavy mortar fire was rained down on the defenders. Gradually, by sheer weight of numbers and their disregard of casualties, the Viet Minh inevitably gained ground. Doggedly, French counter-attacks were still put in and many positions changed hands a number of

times, but the defenders began to tire and they became more and more restricted for elbow room. They fought determinedly on, but the end was in sight. One by one, the outer Forward Defended Localities were overrun or had to be abandoned, but this was as much due to lack of ammunition as to any other reason.

The night of the 6th May, saw another massed infantry attack against the eastern side of the now very much smaller perimeter, which was beaten off. Then, after a two hour artillery and mortar bombardment, the enemy again attacked, this time on the south-west, and by 2 am the south-western positions had all been overrun. By dawn, one of the eastern Defended Localities had been taken and two others had been penetrated. The ever persistent French counter-attack had some local success, but the weight of numbers pressing on them was too great for these to have any real effect on the course of the battle.

### **The End in Sight**

Daylight showed that the Viet Minh had reached, at one point, within a hundred yards from the Command Post. By this time, most of the French artillery had been knocked out and everywhere ammunition was dangerously low. Of the battery of twelve guns near the Command Post, only one 105mm gun was still capable of firing. Needless to say, this solitary gun fired on until all its ammunition had been expended. The artillerymen fought their guns to the end.

At 11 am, on the 7th May, the last wireless report was received from Brigadier de Castries, the Commander, who after giving a resume of the fighting, ended with, "They are a few hundred metres away. They have broken through everywhere." Even so, in spite of the desperate situation, the French carried on the fight and the Viet Minh had no easy walk-over. The main position was not finally overrun until about 5-30 pm that day.

### **"Isabelle" Holds Out a Little Longer**

To the south, "Isabelle" still held out, although her defences had been penetrated in several places, and the enemy

pressure all round was extremely heavy. When it was realised how serious the situation was the Commander, Colonel Lalande, organised an attempt to break-out. But this failed, the garrison being unable to force a way through the thick ring of investing troops. Still they did not give in and the defenders of "Isabelle" fought on. The last wireless message came through at 1-50 am, on the 8th May. It was from a sergeant, who said, "The break-out has failed. In two minutes I shall no longer be able to communicate with you. We shall blow up everything." Ten minutes later "Isabelle" was swamped by enemy infantry.

#### *Comment on the Final Phase*

In comment, there is little one can say about the latter stages of the battle for Dien Bien Phu. It was a glorious military epic and one can only salute the heroism of the defenders who refused to give in and fought grimly on to the bitter end. Survivors' accounts indicate that towards the end, shortage of ammunition was the main handicap, and that no position was given up while the defenders had ammunition left to fire. The morale was high and the leadership good, as witnessed by the fact that the French continued to put in counter-attack after counter-attack until the last hours.

#### REASONS FOR DEFEAT

Commenting on the battle as a whole, we can perhaps speculate on the reasons why, in spite of so much human courage and determination, Dien Bien Phu was lost. There are several points that will stand out to the military student.

Primarily, General Navarre had underestimated General Giap, in anticipating that the Viet Minh would not risk a full scale, set-piece attack. This consideration presumably caused him to neglect to picquet or defend the surrounding hills, and to allow the defenders to group around the airstrip, in the open, in the centre of a large 'paddy bowl'. They were stuck there rather like a cock-shy for the Viet Minh to throw at. The French Commander-in-Chief meant Dien Bien Phu to be a bait designed to draw Viet Minh attention away from the Red River Delta, but he did not take into account the fact that his bait might be swallowed up.



Again, General Navarre did not anticipate that General Giap would use his precious regular soldiers as cannon fodder in the Communistic style massed infantry attacks. The casualties are conservatively estimated to be, on the Viet Minh side, about 18,000, of which about 8,000 were killed, while the French suffered about 4,000 killed and wounded and about 8,000 taken prisoner. The gain was costly as the four regular enemy divisions were decimated and badly knocked about, although as events turned out they pulled themselves together in a remarkably short time.

It also shows the folly of an army relying too completely on being looked after by aircraft. The French mustered numerous aircraft, while the Viet Minh had none, but in spite of the continuous and intense air attacks with both H.E. and napalm, they were unable to prevent General Giap from mounting his attack.

Another factor that must not be overlooked is the fact that the French Intelligence did not show up too well; the numbers and concentration of enemy artillery, together with the fact that they had radar and anti-aircraft guns, came as a complete surprise and had not been catered for by General Navarre in his original appreciation.

#### *Lack of Mobility*

Finally, the main drawback to the whole French idea of 'Centres of Resistance' is their lack of mobility—one of the cardinal principles of war, more important nowadays than ever before. Once the airstrip was put out of action, nothing could get out of Dien Bien Phu and the whole garrison was literally imprisoned, and the initiative was handed to General Giap on a plate.

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## ARMOUR FOR EASTERN THEATRES

MAJOR O. D. P. RATNAM

**C**OUNTRIES in the East have a problem of their own in the selection of various types of tanks best suited for their areas. They are still undeveloped and in the process of industrialisation. They can neither manufacture nor afford to buy and maintain a large force of tanks. One has only to study the state of the roads and other transport and communication facilities to decide against the possession and use of tanks in mass. Except for the USSR, the USA and the UK no nation can afford to produce tanks in large numbers. Besides, there are three distinct types of terrain in the East, the rolling plains, the somewhat swampy river delta areas and the hilly areas. With these various limiting factors in view we may come to a reasonable conclusion on the types of tanks we need. The best way to proceed will be to go through and visualise the various roles and possible employment of armour in the East and find out which type of tanks can accomplish most of the tasks.

### EVOLUTION OF THE TANK

When tanks were originally created, there was no classification as to types. Going through its historical development one finds that the first tank, rather a chariot, was introduced as early as the Biblical times, some centuries B.C. Chariots and wooden carts have been in use from time immemorial, till we come to the days of the internal combustion engine. The first tank, as we know it, after going through the usual red tape and initial pains, took to the battlefield on 15 September 1916. The important fact to be borne in mind is that in all these years, the use of the tank, wooden cart or chariot has always been to strike terror, surprise and shock in the heart of the enemy and thereby destroy him.

In the first World War, the tank was used only to lead

the infantry and destroy the enemy machine-guns. There were few occasions when tanks were employed in mass, but by the time the war was over, the doctrine that tanks could be used for shock action and surprise because of their mobility had already taken root. However, after the war, the accepted doctrine was that the tank was solely meant for infantry support, and this affected its further development.

#### RESPONSIBILITY OF THE TACTICIAN

Here, we come to the question of determining the responsibility for development and employment of tanks in general. For employment it is certainly the tactician and for development it is the technician but advised by the tactician who should be responsible. During the last war, the development of tanks was influenced a great deal by the technicians. As far as the technician was concerned, a tank would not be able to face its adversary unless it was better armed and armoured. But the tactician had to win the fight somehow or other whether the enemy tanks were of the same calibre or better than his own. This he did by the tactical handling of his tanks. So it should be the tactician who should decide the type of tank, limited of course by the technical considerations. The tactician knows the area and the method he is going to use to fight his battles and that would dictate to him the type of tank he requires. The principle behind this is that the tank should be designed and produced in the light of contemplated or expected use. This brings us to the characteristics and employment of armour in Eastern theatres.

#### CHARACTERISTICS OF ARMOUR

The basic characteristics of armour are fire-power, mobility, shock-action and armour protection. Shock action depends upon the way the tanks are employed. The important principle while employing armour is that "the faster it moves and the quicker it accomplishes its task, the more effective will be its success and the smaller will be its losses." To move faster in Eastern areas where good road communications do not exist, road-bound armoured cars will be of no use while light tanks will be best suited. To carry out its task effectively,

the tank should have sufficient fire-power, which will depend upon the type of task to be accomplished. If we presume that it is meeting tank opposition, then the minimum gun should be at least a 90 mm gun. Here the gun is most important. Then comes speed. The armour itself has little value. A tank armed with a 90 mm gun cannot be classified as a light tank. If we want it to have a reasonable speed, which will mean a powerful engine in the power ratio of 1 ton to 15 HP, and carry enough 90 mm ammunition, then the tank becomes a medium. So tanks have to be classified according to their guns. The value of different types of tanks can be easily judged in terms of the three main roles of armour: independent mission, destruction of enemy armour and infantry support.

#### INDEPENDENT MISSION

The age old Napoleonic principles of mobility and speed still remain valid especially in Eastern theatres. Lack of good roads and tracks, heavy bridges and facilities for ferrying across rivers and streams, and the likelihood of encountering different types of terrain in the East indicate the requirement for a light gun tank to achieve mobility. To get there quickly and to create surprise, light gun tanks will do better than the "mediums" or "heavies". The mere surprise which would be achieved is enough to produce shock action but a certain amount of punch is also essential. To give this punch, some medium gun tanks are required. The conclusion is that an independent mission can be carried out effectively by the combined use of light and medium gun tanks. An armoured force made up chiefly of light and medium gun tanks, due to their speed and mobility, can rush through an open breach and exploit in the rear by destroying enemy reserves, supply depots and communication centres.

So, speed is required, accompanied by cross-country mobility, in Eastern theatres. Armoured Cars are not useful because they are road-bound. Speed as such and speed in battle requires a powerful engine. To carry out its task, the tank needs a powerful long-range gun. These two are essential and so the thickness of armour should be the minimum.

The weight of a tank is important in Eastern areas for obvious reasons. This brings up the point of ground pressure. This should never exceed 10 to 11 pounds per square inch. An infantry man is said to exert 15 to 20 pounds per square inch while walking. If the ground pressure of a light or medium tank can be kept down to that exerted by an infantryman, then it becomes theoretically possible to assume that a light or medium tank should go wherever an infantryman goes in an open ground, but this is not so due to various factors like fractional force, type of soil and so on.

Of course, the ideal would be to have a tank which can be transported by rail, road and air. Although some of the modern light gun tanks weigh only about 15 tons and some big aircraft have a payload of some 40,000 pounds, so far no light gun tank has yet been airtransported for various reasons. However, I do not think a tank should weigh more than 40 tons considering the bridging and ferrying facilities here. This limitation in weight automatically affects the thickness of armour, weight of the engine and the weight of the ammunition to be carried.

For carrying out an independent mission, tanks should be prepared for a long radius of action and they have to be self-contained for a longer time. This is where the light gun tank scores over the medium and heavy gun tanks. Since light gun tanks consume much less petrol than the mediums, the supply problems will be easier. In the East, the supply problem, especially of petrol, will be a difficult one as this depends on available roads, pipelines and other transport facilities. A light gun tank can easily fight for two days without refuelling. This will mean cutting down a few supply echelons. But the light gun tank lacks punch. So, the deduction is that either the light gun tank should be equipped with a 90 mm gun or the medium gun tank should have a better range of action, say about 100 miles without being refuelled.

Another point at issue is whether we need a tank or an armoured car for reconnaissance. Without any hesitation, we can declare straightway that the light gun tank is ideal for

reconnaissance in Eastern theatres, although the armies of many countries have armoured cars for this purpose. And other contraptions like jeeps fitted with machine-guns or recoilless guns cannot be used as effectively as a light gun tank. These jeeps may be useful in the deserts and open plains. The argument that a jeep can go practically wherever a light tank can go does not hold any water. The jeep or any other wheeled vehicle has not got the thin armour protection and nor can it defend itself. It cannot carry much ammunition either.

After considering all these, we can conclude that in the East there is necessity for at least two types of armour ; the light gun tank and the medium gun tank. The weight of the tank should not exceed 40 tons and the minimum gun should be of a calibre of 90 mm. When we talk about a light gun tank, I imagine a tank with at least a 75 mm gun and weighing about 15 tons. There are many uses for a light gun tank, provided the Commander employs it properly whenever he wants speed, flexibility, effective fire-power and shock action, but *not* when he wants impact resistance. Perhaps, the ideal would be to use light gun tanks followed by medium gun tanks. There will be occasions when the light gun tanks by their reconnaissance can prevent actions which will be no good for the following medium gun tanks. In a river crossing operation, light gun tanks will have to cross first and be in position till a heavy bridge can be built for the crossing of the medium gun tanks.

#### TANK BATTLES

Coming to the second role of armour, viz. destruction of enemy armour and thereby establishing armour superiority in the battlefield, we find that we must have tanks with powerful guns. Mines, anti-tank guns and other obstacles assist us only in the defence but to win we have to take the offensive. To destroy enemy armour in the offensive, our mobility, fire-power and shock action should be better than the enemy's. In a tank versus tank battle, it is generally believed that the tank which can destroy the enemy at the greatest distance wins the battle. This may not always be correct. This raises the point of the effective fighting range of tanks which depends not only upon

the long range of guns but also on the firing precision and penetrative power of AP shots. For instance two tanks equipped with the same gun but different armour have the same effective range. But, in a tank battle, it is a question of who gets the first accurate shot in. Getting the first accurate shot depends upon the precision of firing, penetrative power of the shot, rapidity in rate of firing, the speed of the tank in getting from one good firing position to another and the man behind the gun. So, the greatest penetrative power is decisive and here, a light gun tank is easily outgunned by a medium gun tank. In tank versus tank battles, the commander who positions his armour quickly in the right place by clever manoeuvring wins the battle. Here, for all the quick moves from place to place a light gun tank is better suited and much faster than a medium but the light gun tank has not got the gun. However, it must be remembered that it is not always necessary to pierce a tank to stop it; just a hit is sometimes enough to put it out of action. From all this we can conclude that thickness of armour is not in itself decisive in determining the value or usefulness of any particular tank. Also the effectiveness of armour-piercing weapons is always one jump ahead of the thickness of armour. The gun and speed are the two important factors.

#### INFANTRY SUPPORT

The third role of armour is support of infantry. This seems to be the popular one with the forces and hence, any tank is judged from the way it can support an infantry attack. There are three recognised and stereotyped methods of supporting an infantry attack. They are —

- (a) tanks and infantry attack on the same axis;
- (b) tanks and infantry attack on a converging axis;
- (c) tanks shoot in the infantry on to the objective — i.e., support by fire only.

Of these three methods, the first two cannot obviously be used against well-organised defensive positions which are strong in anti-tank defences, but can be used against hastily prepared positions. The first method requires a slow tank to keep the pace of the infantryman. What is needed here is not

mobility but armour and armament. So the light gun tanks just cannot take part in this. The heavy gun tanks can. The mediums also can but the armour in front has to be thick. In other words, to make the medium a good infantry support tank, the armour on all sides except the front has to be the minimum to be proof against shell bursts and small arms fire. The second method requires mobility in that it involves quick changing from one firing position to another and also fire-power. It can provide surprise and shock action. The enemy's efforts will be divided. This method appears to be the best of all and here both the light and the medium gun tanks can be used. The third method of shooting-in the infantry requires neither mobility nor armour. It wants fire-power. Surely, the light gun tanks can provide that as effectively as the "mediums" or "heavies".

The first method demands a great deal of team-work, control and co-operation, and a lot of marrying-up before the attack starts. With the limited tank forces available in the Eastern theatres, it may not be practicable to find the same tank unit which has trained already with a particular infantry unit to do the desired quick marrying up essential for the attack to be successful! But in war quick actions have to be carried out and if so, the medium tanks and not the light tanks are necessary to do this task.

For the second and third methods, the armour of a light or medium gun tank is sufficient to withstand small arms fire and shell bursts. The argument that an infantryman can always crawl up with a hollow charge projectile does not stand, because even the heavy tanks are vulnerable to the modern hollow charge projectile.

Now comes the question of impact resistance; a "medium" has a fair amount and a "heavy" has quite enough of it. If we can make only the front side of the light and the medium gun tanks impact resistant and the other sides proof against small arms fire and shell bursts, we have achieved quite a lot. But the impact resistance of armour does not depend merely upon the thickness of armour. It also depends upon the slant



of the sides and the quality of the steel alloy. Titanium alloy, for instance, is said to be lighter but as strong as ordinary steel. Then there is the spaced armour. So, it is up to the commander who uses light and medium tanks to exploit the mobility of the light tanks to the fullest to get over the weakness in impact resistance.

### CONCLUSION

We come to the conclusion that there is a requirement for two types of tanks in the East; the light gun tank and the medium gun tank. The light gun tank should be fast, more than 40 mph, with a gun of at least 75 mm calibre and armour thick enough to be proof against small arms fire and shell bursts. It should be able to fight for at least two days, without refuelling and replenishment. That means it should have a minimum range of roughly 150 miles without refuelling and carry about 150 rounds of 75 mm ammunition. It will be ideal if we can have the front part of the light gun tank increased to some 4 or 5 inches in thickness, but this is technically not possible at present. The medium gun tank which will have to fill also the heavy tank roles and, perhaps, some of the light gun tank's as well, must be fast with at least a speed of 35 mph, be equipped with a gun of 90 mm or 105 mm and have a range of about 100 miles without refuelling. Its weight should not exceed 40 tons. Its ammunition carrying capacity should be a minimum of about 60 rounds.

With the limited tank resources in the East, it will not be possible to draw a clear line as to the tasks of a light gun and a medium gun tank. Gone are the days when the former were meant only for reconnaissance and protection. The light gun tanks can now shoot-in the infantry on to their objectives and even engage medium tanks, provided the commander uses mobility and speed to get over the difference in gun range. It is time we started thinking about reorganising our tank regiments so as to include both the light and medium gun tanks. We should have only one type of all purpose regiment in the East.

## MADRAS RIFLEMEN

MAJOR F. G. HARDEN

A SHORT article on Bombay Infantry in the July-September 1955 issue of the Journal alluded to the 'flank companies' of Indian infantry as they existed before 1864, and stated their functions. Perhaps a few words about Riflemen in the Madras Army would not come amiss.

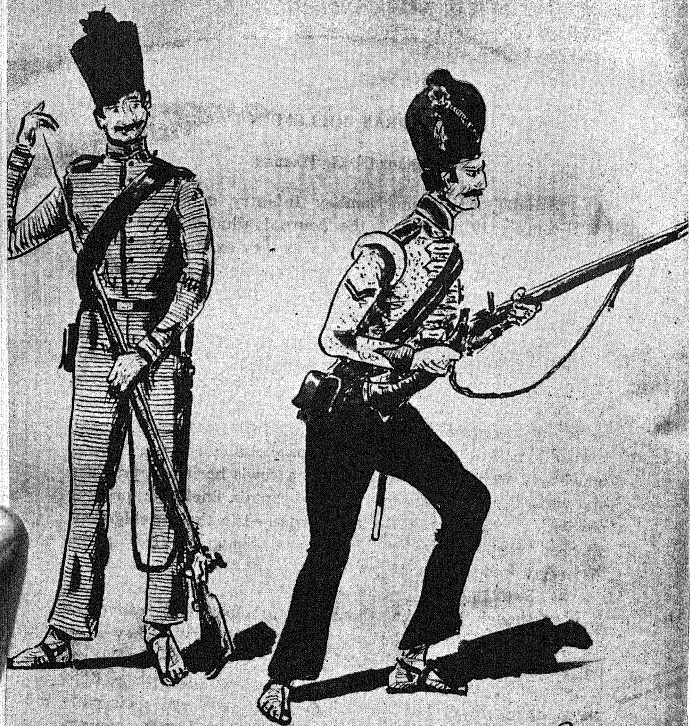
In 1812, the Government of Fort St. George decided to introduce rifles into their infantry. Four battalions were chosen—the first of the 3rd, 12th and 16th and the second of the 17th. They exchanged their flint-lock smooth-bore muskets and socket-bayonets for Baker rifles having two grooves and sword-bayonets, and their white buff cross-belts for black leather pouch and waist-belts. In addition, a cow's horn was provided and worn slung over the right hip to contain fine-grain 'priming powder', as the coarse propellant contained in the cartridge was apparently unsuitable for this purpose though effective in the discarded weapons.

Although these battalions had in effect been converted into 'Rifles', they were designated 'Light Infantry'. They were not permitted the distinction of wearing green clothing but, as a concession, their original facings of, respectively, white, light green and yellow were altered to dark green and their cuffs made pointed.\* They further identified themselves by appearing in black trousers in full-dress and other occasions where white cotton ones were customary.

Possibly the performance of these early grooved weapons was disappointing, or perhaps they were too expensive, for we hear of no further re-armament for another thirty years when

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\* Curiously enough heretofore a mark of riflemen and light infantry in Continental armies but not in the British!



IFLE COMPANY

6<sup>TH</sup> MADRAS INF

1850.

NAIK

1/3 MADRAS L.I.

1820.

*E. R. H.*

all three Presidency armies began to issue percussion Brunswick rifles to a few selected units.

In Madras we find the 'Light Companies' of the 1st, 5th, 16th, 24th, 26th, 36th, 38th, and 49th regiments being converted into 'Rifle Companies'. Officers and men in these not only received the appropriate black leather equipment but were dressed in dark green: very suitable no doubt for their role as skirmishers and snipers, but it must have provided a curious contrast when parading with their red-coated comrades of the other companies!

The four original rifle-armed regiments continued to wear red.

In 1857 a temporary regiment, known as 'The Madras Rifles', was formed for service in Bengal by grouping the rifle-companies of the 1st, 5th, 16th, 24th, 36th and 49th regiments and adding two from the 34th (Chicacole) Light Infantry (originally 2<sup>nd</sup> 17th).

Madras Infantry, as a whole, were not armed with grooved weapons until the issue of Enfield rifles in about 1870.

The details of uniform as shown in the illustrations are taken from original water-colour sketches, executed about 1855, acquired by the late Lord Roberts while he was Commander-in-Chief Madras Army, and recently presented to the Royal Military Academy, Sandhurst. One shows a naik of the 3rd Madras L. I., a regiment which, after an honourable existence of more than one hundred and sixty years, was, as the 63rd Palamcottah L. I., disbanded in 1923 on grounds of economy. The other is a sepoy from the rifle company of the 26th Madras infantry, which in 1923 became the 10th Bn, 3rd Madras Regiment. There will be many still enjoying life, it is hoped, from those who served in each of these two famous old regiments of the South.

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## WELLINGTON'S INDIAN CAMPAIGNS

SQUADRON LEADER D. R. SETH, I.A.F.

**T**HE Duke of Wellington—the Victor of Waterloo, and the greatest British soldier of the 19th Century—first gained his spurs in India. It was here in our country that he first saw active service and where his military genius blossomed out. It was here that he learnt the art of handling troops in battle and the lessons learned here were later applied to achieve his successes in Europe. The ‘Sepoy General’ matched his wits against the supreme military genius of all times and beat him at his own game.

Wellington, or Arthur Wellesely as he was then called, arrived at Calcutta early in February 1797. In August of the same year his regiment formed part of the expedition sent to capture Manila, but the force was recalled from Penang and Wellesely and his regiment returned to Calcutta. In September 1798 he was placed on the Madras establishment.

### BRITISH POSITION IN 1798

The British regime in India was facing a very difficult situation. In Hyderabad the weak rule of the Nizam was bolstered up only by a French corps trained and officered by a handful of French military adventurers. In Mysore Tipu Sultan was feeling restive and on the look out to restore his fortunes shattered as the result of the Second Mysore War of 1792. In his search for allies against the British, the only one he could see were the French. The Mahratta Empire was crumbling. Napoleon stood at the foot of the Pyramids with his covetous eyes turned towards India.

It was in real thick soup that the British found themselves at the turn of the 18th Century. But they were lucky. They found a man to plan and a man to execute grandiose schemes which resulted in the subordination of the Nizam, the

destruction of Tipu Sultan, the humiliation of the Mahrattas, and the total uprooting of French influence in India. These two men were brothers, the elder the Marquis of Wellesely the Governor-General, and the younger Major-General Arthur Wellesely, the future Duke, the Commander of British forces in the field.

### MYSORE WAR

The first move was made against Tipu, the most inveterate enemy the British had in India. Tipu's name has been dragged in the mud by British historians. He has been called blood-thirsty, a tyrant and a brigand. But his only fault was that he was born before his time. He was a visionary, a patriot who refused to bow his proud neck before the foreigners. He was perhaps the only man in India at that time who loved freedom, and who saw the danger of British supremacy in India.

Preparations against Tipu were started in November 1798 and in February the following year British forces invaded Mysore. The Carnatic Army under General Harris attacked from the east and the Bombay Army under General Stuart came in from the west. In the ensuing campaign Wellesely commanded the Subsidiary Force and the Nizam contingent.

The Carnatic Army marched from Vellore on February 11th and the Bombay Army started from Cannanore on the Malabar coast a week later, thus catching Tipu between the two pincers. The Sultan put up a brave resistance and was victorious in several minor engagements, but in the end was forced to shut himself in the fort of Seringapatam. In the siege that followed Wellesely played a minor part. Attacking and carrying a 'tope' or grove of trees, at the head of his troops was the only contribution made by him. On May 4th the final assault was made and the fort captured, although the Tiger of Mysore disputed every inch of the ground and died fighting.

### ADMINISTRATOR OF MYSORE

When the fighting was over, Tipu's sons were deported to Vellore and the old Wadiyar dynasty, dispossessed by Haider Ali, was restored to the throne. Wellesely was appointed the

Administrator and Commander of all British and Mysore troops in the State.

Wellesely's first business was to restore order in the Capital and he did this with such energy and method that the place was quiet in a short time. He next undertook the settlement of the country. During the first months of the year 1800 a more serious matter began to engage his attention. Among the prisoners liberated by the British after the fall of Srirangapatam was one Dhundia Waugh a notorious Mahratta free-booter whom Haider Ali had captured and imprisoned. On getting out Dhundia took up his old profession and soon proved himself to be a thorough nuisance. Attempts made by his subordinates to capture the bandit failed and so Wellesely himself took the field. After a witch's dance of four months, Wellesely brought Dhundia to book on the banks of the Malprabha river. Dhundia was killed and all his followers either captured or killed. This was a great feat and enabled Mysore to settle down to peaceful avocations.

During the next two years, with a brief intermission when he left Mysore to take part in an expedition to Batavia, but which came to naught, Wellesely was fully occupied with the civil and military administration of Mysore. Refractory vassals like the Raja of Bullum and the Nairs of Wynaad were subdued.

#### THE MAHRATTA WAR

In March 1803 acting on orders Wellesely marched with his force to the Tungabhadra to take part in the Mahratta war.

The campaign, which is commonly called the Second Mahratta War, was the result of inherent weaknesses of the Mahratta confederacy, the presence on the throne of the Peshwas of a weak, capricious and intriguing man who in order to strengthen his own position was prepared to see the sovereignty of his people destroyed and himself become a stooge of the foreigners.

Baji Rao II, the last Peshwa, came to the 'gadi' in May 1796 through the help of Sindhia and the acquiescence of Nana Fadnavis, that 'wily old bird' who had been the corner-stone

of the Mahratta confederacy for so long. But he soon determined to ruin Nana and get himself rid of Sindhia. Nana was arrested and died two years later in disgrace. Sindhia was a harder nut to crack, and he remained at Poona at the head of a large force. Baji Rao gave free rein to his passions and perpetrated a series of atrocious cruelties which alienated his subjects and brought upon himself the wrath of Jaswant Rao Holkar whose brother Vithuji he had murdered. In August 1802 Jaswant Rao, to avenge the crime, invaded Mahratta, and defeated the combined forces of Sindhia and Baji Rao. The latter left his capital, fled to the Konkan and sought the help of the British. Thus on the last day of the year 1802 the Peshwa signed the Treaty of Bassein which purported to be a general defensive alliance, but which actually meant the sacrifice of his independence by the Peshwa. At that time Wellesely was ordered to march on Poona, secure the capital, and reinstall Baji Rao. This happened in May 1803.

The other Mahratta leaders regarded Baji Rao's act as traitorous, which it was. The bringing in of the British as arbiters in their domestic politics they considered a threat to their independence. The only way open to them was to resort to arms to redress the situation. Sindhia and the Raja of Berar joined forces and crossed the Narbada. Wellesely asked them to separate their forces and recross the river. On their refusal war was declared in August, 1803.

On the outbreak of hostilities Wellesely left Poona at the head of his army of about 7,000 men exclusive of camp-followers, intent on the capture of Ahmednagar the possession of which would ensure the safety of his lines of communications with Poona and Bombay. On 8th August it fell, Sindhia's men putting up only a token resistance as their loyalty had been sabotaged. On the 8th Wellesely moved towards the Godavri, and advanced towards the Mahrattas.

In the meanwhile the Mahratta chiefs left the Narbada, entered the Nizam's territory and advanced in the direction of Jalna. Wellesely therefore advanced to Aurangabad and from thence moved south to the Godavri, and kept along that river in order to prevent the Mahrattas from crossing it.



Meanwhile another British force under Col. Stevenson, advancing from Jafarabad, stormed and took the fort of Jalna on 2nd September and by repeated night attacks on the Mahratta camps forced them to retire in a northerly direction. Wellesely also then moved northwards, and checking the Mahrattas moving south forced them towards the Ajanta Hills.

Sindhia had in the meantime been joined by his infantry and heavy guns, and so the combined Mahratta army concentrated south of the Ajanta Pass near Bokardhan.

On 21st September Wellesely and Stevenson met and concerted a plan to attack the Mahratta camp simultaneously on the morning of the 24th. On the 22nd the two commanders marched by different routes towards Bokardhan. Next day, the 23rd, Wellesely left his stores and baggage at Nalni and advanced to arrive within striking distance of the Mahratta armies on the following day, when he suddenly found himself in the presence of the combined Mahratta armies, drawn up on a tongue enclosed by the Juah and Kailna rivers, their left on the village of Assaye, their right stretching towards Bokardhan.

#### THE BATTLE OF ASSAYE

The Mahratta army was skilfully disposed. Their left and centre were composed of infantry drawn up in several lines, in front of which their guns stood. The cavalry was concentrated in dense masses upon their right. In front of their whole position ran the river Kailna. Behind them at a distance of about a mile flowed the Juah.

Wellesely's army crossed the Kailna by a ford. His plan was first to attack and drive in the Mahratta right and then advance on the village of Assaye. But things turned out differently. At the commencement of the action the British artillery was almost overwhelmed, nearly all the bullocks and men employed to drag the guns being shot down. The Officer commanding the picquets on the right, where the fire was the hottest led his men forward to silence the guns. Other infantry battalions followed and the engagement soon became general. The British troops lost very heavily from artillery fire and would

have broken and fled, especially when they were being attacked at the same time by Mahratta horse. At this time the eagle eye of the General saw how events were shaping and he ordered the British cavalry to advance and beat back the Mahrattas.

Wellesley next ordered the whole line to advance. Soon it came to a charge. At this time some European Officers of Sindhia deserted their posts and fled. The infantry, thus deserted by their officers, broke and fled. But the gunners held firm to their guns, and died in their places. It was a fiercely contested battle, one of the fiercest the British ever fought in India. In a letter to Major John Malcolm, Wellesely himself admitted that at one time he was doubtful of success.

The casualties were heavy on both sides. The Mahrattas lost 1,200 men dead and many wounded. The British lost 400 killed and nearly 1,700 wounded.

#### THE BATTLE OF ARGAUM

From the stricken field of Assaye the Mahrattas retreated northwards into Berar. At Burhanpur they rallied once again and also received reinforcements. Feeling themselves strong enough for another encounter the Mahrattas once again turned southwards to re-enter Hyderabad.

To ward off the new threatened invasion Wellesely moved towards Aurangabad, and at the same time despatched Stevenson to capture Asirgarh. The successive moves of the two armies are too complicated to be detailed here. Suffice it to say that Wellesely's pursuit of the Mahrattas ended on November 29th when he once again came into contact with them, drawn up on a broad plain in front of the village of Argaum.

The Mahratta army again stood with their infantry and guns in the centre and with masses of heavy cavalry on their left and right flanks. The whole line extended above five miles. Wellesely formed his army in two lines; the infantry in the first, the cavalry in the second and supporting the right which was rather advanced, in order to press upon the Mahratta left.

When everything was ready Wellesely ordered the infantry to advance. Putting himself at the head of his cavalry

he advanced against the main body of the Mahratta horse, which supported by a large rocket corps mounted on camels awaited his approach. When the cavalry had advanced to within six hundred yards of the Mahratta position, he ordered the galloper-guns to open upon them. The guns having produced sufficient effect, the cavalry charged. In the meanwhile the infantry too had advanced with their guns and when within musket-shot of the Mahrattas, the whole line pushed forward at the charge and drove away their opponents. Sindhia's cavalry attacked the British infantry on the left but were driven off. Soon the whole Mahratta army broke and fled leaving Wellesely the victor once more.

A part of Sindhia's infantry under Beni Bahadur succeeded in throwing themselves into the fort of Gawilgarh. So Wellesely next advanced on that fort which though reputed one of the strongest in India fell after a siege of one week.

#### CONCLUSION OF HOSTILITIES

The series of defeats suffered by Sindhia and Bhonsla at the hands of Wellesley brought the war to an end. Bhonsla at once sued for peace, which was concluded at Deogaon on December 17th 1803. A fortnight later hostilities with Sindhia were also brought to a close by the treaty of Surji-Arjungaon.

#### CAUSES OF WELLINGTON'S SUCCESS

Let us pause here and see the causes of Wellington's brilliant success and the defeat of the powerful Mahratta rulers.

The success of a general can be attributed to two reasons ; his personal merits and the inefficiency of and the mistakes made by his enemies. In Wellington's case also these two causes operated. Taking the second cause first ; we can see from the conduct of the campaign by the Mahratta leaders, that they did not have much knowledge of military strategy. The Mahrattas had trained infantry but they did not have any trained and up to date artillery. Co-operation between the two arms, which is so necessary for success, was not there. Moreover the Mahrattas had inferior equipment. Individually very brave

and stubborn fighters they could not do much against the better trained and better equipped British troops.

Mahratta leadership also could not be compared with the military genius of the British commander. Sindhia was a young man with no experience in the art of war. He had to depend on subordinates who in most cases were not any better. Treachery was rampant in their ranks. Most European officers deserted at the outbreak of hostilities. Even some of the Mahrattas were not above betrayal. This explains to a large extent the easy capture of strong forts like those of Ahmednagar, Asirgarh and Gawilgarh.

In another field—the diplomatic field—the war had already been won before the shooting started. The British proved past masters in the diplomatic game. The danger of all Indian rulers joining together to fight the foreigners was avoided by subtle diplomatic moves which succeeded in buying not only the neutrality but the active participation on their side by the Nizam and the Peshwa—the head of the Mahratta confederacy.

To sum up the Mahrattas were defeated because they were not united, and because they had lagged behind in the progress made by the art of war.

But all this should not blind us to the personal merits which brought Wellington victories.

A perusal of Wellington's despatches and correspondence and the accounts of those who were with him during the war throw a flood of light on Wellington as a general. His principal characteristics appear to have been the attention he paid to all details, so that nothing was omitted that could contribute to success, and a stern and pitiless conduct of war, without which military operations cannot succeed. There was no weakness in him, no dallying with the enemy, but the pursuit of a campaign to its logical end and with all speed. An officer who served under him has written: "The appearance and demeanour of General Wellesely were such as to inspire confidence. All those who served under him looked up to him with that degree of respect, I might almost say awe, which, by combining an implicit obedience to his commands with an unbounded confi-

dence in the wisdom of his measures, was calculated to draw forth all the energies of men in the execution of his orders."

He was a hard disciplinarian. But every page of his despatches shows his care for the comfort and well-being of his troops. He was full of dash and never wavered from attacking forces larger than his own.

#### LATER DAYS

The war ending, Wellington with his Deccan Army retired to Poona. In March he went to Bombay and from there wrote to the Commander-in-Chief asking permission to relinquish his appointment and return to Europe. This was because he was not satisfied with his progress in the service. In May he was called by the Governor-General to come to Calcutta to confer with him and the C-in-C. He was accorded a great reception in Calcutta, the Governor-General himself came down the river to receive him. In November he was once again appointed to the command of the Deccan Army with headquarters at Seringapatam. He held his new job only for a few months and left the Indian shores in March, 1805, for fresh fields of glory.

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REVIEWS**MEDICAL SERVICES—ADMINISTRATION**

EDITED BY LIEUT.-COLONEL B. L. RAINA, A.M.C.

*With Illustrations and Maps**Combined InterServices Historical Section (India & Pakistan),  
Rs. 30/-*

The editor and the contributors are to be congratulated on the appearance of this volume. This is the first time that India has compiled an exhaustive history of the part played by her medical services in war.

The army in war time is quite different from that in peace. War brings in its wake many problems and many of the old problems assume enhanced importance under war-time stress. During the Second World War the Indian Army expanded to 10 times its original strength. The medical services correspondingly increased from small beginnings at the outbreak of war, and by the cessation of hostilities in 1945, nearly 1,700 medical units had been mobilised and 200,000 beds provided. It is fascinating to follow the gradual unfolding of the story. The recruitment of necessary personnel and supply of needed equipment to these newly raised units was a stupendous problem.

Different chapters deal with the many aspects of the administrative problems, starting with the development of the administrative headquarters of the medical services. The evolution of each component of the integrated Medical Service, i.e. Army Medical Corps, medical services for the Navy and the Air Force, Dental Corps, Military Nursing Service, and Indian Hospital Corps, is dealt with in subsequent chapters and is of absorbing interest.

The chapters on reception and distribution of casualties deserve special mention and show how the impact of global war can mould our methods of evacuation of casualties. There

are 19 valuable appendices to this volume, and over two dozens of graphs, charts and maps which supplement the reading matter. The important role of the various voluntary organisations which provided relief and aid to the troops has been stressed by inclusion in the appendix of special articles on the subject. This aspect is important in the context of our present status; the Armed Forces of an independent nation are part and parcel of the nation and in a total war the civil and armed population cannot be separated into strict watertight compartments. Each has to depend on the other for its very existence. This spirit of mutual dependence was amply manifested during the last war. Civilians as individuals and as organisations came forward to help the Armed Forces; while in times of stress like the Bengal Famine the Army came to the aid of Civil authority.

The book is well produced and will find a welcome place on the book-shelf of most medical men.

B.B.

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## MEDICINE, SURGERY AND PATHOLOGY

EDITED BY LIEUT.-COLONEL B. L. RAINA, A.M.C.

*With Illustrations and Maps*

*Combined InterServices Historical Section (India & Pakistan),  
Rs. 40/-*

The primary function of military medical services is the maintenance of man-power in a state of fighting efficiency. Prevention and treatment of disease is one of the principal means by which this primary function is fulfilled.

In this present volume will be found the results of first hand observation of the clinical and pathological features of many important diseases, and the problems faced by military medical services in adequately dealing with them. For example, how to treat malaria without quinine had to be solved if military operations were to continue in fields like the Indo-Burma front: if this problem was not adequately solved the whole course of the campaign would have been adversely influenced.

This volume deals not only with Medicine, Surgery and Pathology but special chapters have been allotted to research carried on in the Services. The selection of subjects has been judiciously done. Special branches like neurology, psychiatry, venereology, radiology, blood transfusion and dental services, have each been given a separate chapter.

The diseases which have special importance in the tropics, like malaria, dysentery, the typhus group of fevers, the effects of heat, have been specially dealt with by experts.

In war the problem of fighting diseases is as complex as tending the wounds. For every one soldier wounded on the Indo-Burma front 204 were sick in 1942 and 142 in 1943. By 1945 the ratio of battle and non-battle casualties was reduced to 1 : 13. This shows a remarkable standard of efficiency attained by the Medical Services in the fields of research, prevention and therapeutics. A perusal of this book does give a rough idea of the difficulties met with in tackling these problems and the thoroughness with which various problems were studied. Probably many would have liked the inclusion of a wider range of subjects ; it is understandable that the editor could not cover such a wide field in so small a compass.

One small note of criticism. If the names of the contributors and collaborators had appeared at the head of each chapter, reader-interest would have been more than in the present impersonal presentation. As there is an apparent diversity in the style and method of presentation of each chapter, it is felt that this would have been desirable.

We look forward to the publication of the other volumes to be devoted to campaigns, preventive medicine, statistics, and medical stores and equipment.

B.B.

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**GUIDED MISSILES IN WAR AND PEACE**

NELS A. PARSON, JR.

*Harvard University Press, \$3.50**(Distributed in India by Oxford University Press)*

The implications of the combat employment of guided missiles must be studied by all Service Officers. The military professional knows that the means of victory must be held by even those who hate war. In any future major war, the civilian populace too will be affected by guided missiles. The aim of this book, therefore, is to familiarise the public with these new weapons, how they function and how they may be employed.

The author narrates that the first guided missile specialist, according to Chinese history, was Wan Hu, a scholar and scientist of some centuries ago. He lashed several rockets to his sedan chair and proceeded to disappear in the blast. The most recent would-be space traveller is Wernher von Braun, who is notable for his development of the German V2 Rocket and is now working for the US Army.

As early as 1915, Robert Goddard of Clark University, Massachusetts, experimented with solid propellant rockets and later with automatic gyroscopic missile stabilisation. Goddard made his findings available to all, but the only nation that took full advantage of the information was Germany. It can now be seen why the Germans entered the war far ahead of the Allies in the development of guided missiles. The German advantage was not determined solely by superior scientific genius, as is commonly believed, but by six years (1933-1939) of organised research and development before World War II. By the end of the war, the Germans had worked on about 140 different guided missile projects. If the war had continued only a few more months, its final end might have been considerably delayed by German guided missiles.

Progress since the war has been rapid and we are now almost monthly confronted with a new missile development. We are now all conversant with missile names, such as Viking,

Bumper, Wac Corporal, Nike, Matador, Falcon and Aerobee, among others.

The existence of one type of missile tends to lead to the development of another. It may well be argued that we need guided missiles, but what are the problems involved in using them? These the author explains. For one thing guided missile units will require considerable logistic support. Production cost must also be taken into consideration. While the cost of the missile may be high, the total expense of destroying a particular target may be less than with any other weapon because of the increased accuracy and lethality of the guided missile. The practical problems of research and development, field testing, production, transportation, training and reliability of operation all add to the cost. But guided missiles are born of utter necessity and, therefore, in spite of all problems they will be developed. They are adaptable to all types of combat and to all forms of military operations. The author discusses in turn their employment in aerial, naval and land combat. They will be employed widely in the deadly game of war.

In addition to the purely operational use of these weapons, the reader is given an insight into the eventual non-military application of many mechanisms and techniques now found on guided missiles. Faster travel on this planet and the only means of exploring space will be by-products of guided missile development.

Major Parson is at present working in the Combat Developments Division in the USA. The charts, photographs and bibliography are excellent, as also are the various definitions into which we are easily initiated.

S.L.M.

**COMMUNIST GUERILLA WARFARE**

BRIGADIER C. AUBREY DIXON

AND

OTTO HEILBRUNN

*George Allen & Unwin, 18/-*

Before the Second World War, little was known to the world regarding guerilla warfare, as developed by the Communist countries. Vaguely we heard of "guerilla operations" by the Chinese Communists against the invading Japanese columns in Manchukuo and China, but scant attention was paid to this type of warfare. It was only in World War II that the real value of partisan warfare was brought out. But even so, the Allied armies did not really feel the full impact of this type of warfare. It was mostly on the Russo-German and Sino-Japanese fronts that the mass use of guerillas was practised.

Guerilla warfare has come to stay. Future conventional forces will benefit greatly by using guerilla auxiliaries, not only as a hard-hitting fighting force but also as an outstanding intelligence service "on the other side of the hill". This is the lesson of the Russo-German campaign, and a lesson which should be fully appreciated by the Western powers.

Although Mao Tse-tung is the foremost strategist of guerilla warfare, it was Stalin and his Red Army which really put his teachings to practical use on a modern basis, in the earlier campaigns against Germany—1941-43. As a result of their experiences, the Soviet Satellite States of the post-war era have without exception organised their own guerilla brigades.

The book deals mainly with the development of guerillas by the Russians. It has discussed in detail the tactics, organisation and supply of Soviet guerillas, and in Part II, describes the measures adopted by the Nazis to combat this menace. The German "Organisation for Anti-Partisan Warfare," its development and tactics, make interesting reading.

The authors suggest that preparations for future warfare must include training and organisation for guerilla operations—

not only for use by one's own side, but also for combating the enemy's guerilla menace. The subject requires considerable study, and such aspects as relationship between guerilla warfare and the local population, functioning of guerillas under the over-all plans of the theatre C-in-C, and the particular study of communist guerilla methods, might profitably form the subject of a comprehensive Army Training Manual.

D.K.P.

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### DEFEAT INTO VICTORY

FIELD-MARSHAL SIR WILLIAM SLIM

*Cassell, 25/-*

It was given to very few senior commanders of World War II to serve continually in the same theatre of operations from the beginning to the end. Field-Marshal Sir William Slim was one such commander; and as historian he has been able to give us a book which is a complete and objective account of the Burma campaign. This is what makes "Defeat into Victory" so different from many other such personal accounts which have been written by other famous commanders.

The Burma War was Slim's war. From the time when he hastily organised his new headquarters (of 1 Burma Corps) in March 1942, to the occasion in September 1945 when, as the Allied Land Forces Commander in South-East Asia, he received in unconditional surrender the Samurai sword of his opponent, Kimura, the war against the Japanese in India and Burma remained under his personal direction. From the disorderly and decimated armies which slunk back into India through the jungle trails of Manipur; from the Indian, British, Chinese, American and Burmese forces which came under his command at various times, he forged and wielded the weapon with which Defeat was turned into Victory.

How this was done, how the seemingly impossible was achieved, is the subject of his book. It is not merely a war history, a professional account of military engagements; it is a human story of protracted struggle, of despair and defeat, of

magnificent recovery and of the final glorious effort of the "Forgotten Army" in driving the enemy out of Burma. It is at once a history of war and a testament of soldierly faith. No one can read it without being stirred by a deep sense of pride in the achievements of those who took part in the campaign.

This is a gripping story of what must have at times been heartbreaking experience. In a war which was always fought with shortages of troops, arms, equipment and supplies, it is evident that only the inspiration of Slim's leadership could have maintained in his Army a fighting spirit and the will to win. This much the reader infers, but not from what the author has written. For, at every stage, the Field-Marshal makes clear to whom should go the credit for the achievement. . . . "And then I walked once more among my soldiers, and I, who should have inspired them, not for the first or last time, drew courage from them." It was not for nothing that we knew him as "Uncle Bill".

The author does not hesitate at self-criticism. He acknowledges the mistakes which he feels he made in the conduct of his campaign. But it is only himself that he criticises; for his subordinate commanders and staff he has nothing but the highest praise. This is typical of the man.

"Defeat into Victory" is an absorbing book from start to finish. Illustrated by 21 excellently produced maps and sketches, it gives the reader a clear objective picture of the developing battle, both of our troops as well as of the enemy. For lay readers the wealth of detail—most battles are described at brigade level—might be a shade too elaborate; but for the military reader, it is a most excellent account for study.

D.K.P.

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## SECRETARY'S NOTES

### The Journal

The new printing types used in the text of the Journal, it will be noticed, are a distinct improvement which makes for easier reading.

### Subscriptions

Subscriptions are payable in advance at the beginning of each calendar year. Members joining at any time of the year are supplied with all available back issues of the Journal for that year.

### Corresponding Member

Instructor Commander I. Chowla, I.N., is the new Corresponding Member of the U.S.I. from Naval Base, Cochin.

### Library Catalogue

Members, especially those at outstations, will find the printed catalogue a great help in selecting books from the Library. It is priced Rs. 6 plus postage.

### Change of Address

To enable the address list to be kept up to date members are requested to notify any change of address to the Secretary's Office. Where applicable I.C. numbers may also be given. Please make use of the printed form given elsewhere in this issue.

### New Members

From 1st February to 30th April 1956 the following members joined the Institution :—

ADISESHIAH, Dr., W. T. V., Defence Science Organisation.

APTE, Captain A. S., Signals.

ATKINSON, Lieut.-Commander J. S. M., I. N.

\*BALINDER SINGH GREWAL, 2[Lieut., Artillery (T.A.).

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\*Life Member.

BEDI, Pilot Officer R.S., I.A.F.  
BHADRA, Pilot Officer A.K., I.A.F.  
BHAKAY, Pilot Officer S.C., I.A.F.  
BHANDARI, 2|Lieut. J.S., The Bihar Regiment.  
\*BHARGAVA, Lieut. M.S., E.M.E.  
BHATIA, Surg.-Commander H.L., I.N.  
BHATIA, Group Captain S.P., I.A.F.  
BHAVNANI, Flight-Lieut. K.V., I.A.F.  
BINDRA, Major J.S., The Grenadiers.  
BIRENDRA SINGH, Pilot Officer C., I.A.F.  
BISWAS, Lieut. T. P., The Madras Regiment.  
BRAGANZA, Lieut.-Commander E.G., I.N.  
CHACKO, Wing Commander A.W., I.A.F.  
CHENGAPA, Pilot Officer M.K., I.A.F.  
CHHAGAN SINGH, Lieut.-Colonel, 1st Gorkha Rifles.  
CHOPRA, Pilot Officer S.K., I.A.F.  
CHOUDHURY, Captain J.N., A.S.C.  
CHOWLA, Instr.-Commander I.N., I.N.  
DHARMARAJ, Squadron-Leader P., I.A.F.  
DUGGAL, Lieut. V.P., I.N.  
GAYNOR, Pilot Officer P.E., I.A.F.  
GEORGE, Flight-Lieut. T.C., I.A.F.  
GHUFRAN, Lieut.-Colonel M., A.S.C.  
GUHA, Pilot Officer B., I.A.F.  
JAI SINGH, Captain, The Grenadiers.  
JAITLEY, Pilot Officer V.C., I.A.F.  
JASJIT SINGH, Pilot Officer, I.A.F.  
JASWANT SINGH, Captain, The Grenadiers.  
JOHN, Wing Commander G.K., I.A.F.  
KAMATH, Lieut. D.A., I.N.  
KHAZAN SINGH, 2|Lieut., Signals.  
KIRPAL SINGH, Pilot Officer, I.A.F.  
KISHEN SINGH, Major, The Grenadiers.  
KUMAR, Lieut. B.N., Engineers.  
KUMAR, Pilot Officer J., I.A.F.  
KUMAR, Pilot Officer R.R., I.A.F.  
KUMAR, Lieut. S.S., I.N.  
LAI, Colonel R.C.

LALL SINGH, Captain, The Grenadiers.  
 LEWIS, Pilot Officer K.D., I.A.F.  
 LOWE, Pilot Officer, M.M., I.A.F.  
 MALIK, Captain A.N.A.  
 MATHUR, Lieut.-Commander P.N., I.N.  
 MENON, Lieut.-Commander P.R.G., I.N.  
 MISRA, Pilot Officer N.M., I.A.F.  
 MOHINDER PAUL, Pilot Officer, I.A.F.  
 MOHITE, Major-General H.M.  
 MOORTHY, Captain M.S.K.  
 MUKERJEE, Captain P.K., I.N.  
 MUKERJI, Pilot Officer A.K., I.A.F.  
 MURTHY, Lieut.-Colonel K.S. Keshava.  
 NAIDU, Pilot Officer M.K., I.A.F.  
 NAIK, Wing Commander M.B., I.A.F.  
 NARAIN SINGH, Captain, The Grenadiers.  
 NARINDER SINGH, Major, The Garhwal Rifles.  
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 PINTO, Lieut.-Commander E.L., I.N.  
 PRITAM JIT SINGH, Esq., Dy. Supdt. of Police.  
 \*RAGHAVAN, Captain K.V., 1st Gorkha Rifles.  
 RANBIR SINGH RANA, Pilot Officer, I.A.F.  
 RATTAN, Lieut.-Colonel K., 1st Gorkha Rifles.  
 RAWAT, Captain R.C., Signals.  
 SARKAR, 2/Lieut. A.K., Engineers.  
 SHARMA, Major B.D., Engineers.  
 SHARMA, Lieut. G.D., A.S.C.  
 SHARMA, Pilot Officer M.M., I.A.F.  
 SHARMA, Lieut. M.R., I.N.  
 SHARMA, Pilot Officer O.P., I.A.F.  
 SHELBY, Pilot Officer L.P., I.A.F.  
 SHUKLA, Pilot Officer S.D., I.A.F.  
 SHRI RAM GUPTA, Captain.  
 SIBAL, Colonel H.K.  
 SINGH, Lieut. R.S., The Grenadiers.



SIVASWAMI, Flight.-Lieut. R.S., I.A.F.

SMITH, Major J.P.M., Engineers.

\*SOWANI, Major V.G., Signals.

SUKH DAYAL SINGH GILL, Lieut., The Grenadiers.

TULJAPURKAR, Major D.V., A.S.C.

VERDI, Pilot Officer N.S., I.A.F.

WADALIA, Major-General M.S.

\*WALWALKAR, Captain C.P., E.M.E.

WYNNE, Lieut-Colonel L.R., A.S.C.

### SUBSCRIBING MEMBERS

Seven Officers' Messes and Units were enrolled as subscribing members during this period.

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\*Life Member.

### CHANGE OF ADDRESS

To,

Secretary,  
United Service Institution of India,  
Kashmir House, New Delhi.

Date.....

Please note my new address.

Name (in block caps).....

Rank and unit.....

Permanent address.....

Present address.....

Signature.....

# The Journal of the United Service Institution of India

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*The views expressed in this Journal are in no sense official, and the opinions of contributors in their published articles are not necessarily those of the Council of the Institution*

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## EDITORIAL NOTES

### Disarmament in China

During the Eighth Communist Party Congress held in Peking in September, the Chinese Defence Minister Marshal Peng Teh-huai informed the members that the armed forces of the country now totalled 2,700,000 men fewer than the maximum strength reached during the 'liberation' wars. The Marshal, who is also a Politburo member, gave further details of demobilisation: five million men had been fully demobilised since 1949, while 31 Divisions and 8 Regiments had been transferred to national construction duties.

In this first major military policy announcement, the role of China's armed forces has been clearly defined, and is significant. Although the army was declared to be 'strategically' on the defensive it was nevertheless 'to be

prepared to liberate Taiwan at any time.' As far as the West is concerned however, only the defensive has been stressed. 'Our defence construction will continually be strengthened and improved to meet effectively any possible sudden attack by the imperialists.'

National construction claims a large share of the activities of the armed forces, and is included as one of the military 'aims'. Over the past few years, the fighting forces of the nation have undertaken not only defence engineering constructions, but have also contributed in large measure to the strength of the enormous construction corps in Sinkiang and Chinghai provinces.

Another significant item in this announcement concerns the defence budget. Although actual figures were not revealed, it was stated that expenditure on the armed forces had been scaled down from the 1951 figure of 48% of the national budget (during the Korean crisis), to the present low percentage of 19.98, (1955-56).

It appears from this policy announcement that the Chinese Government have already followed the lead given by the Soviet Union. Marshal Peng has confirmed that China would make further reductions in her armed strength when a measure of accord has been reached between the Soviet Union and the Western powers regarding the former's disarmament proposals.

### **Russian Military Power**

As though to offset recent claims made by the Soviet Union regarding the reduction of her armed strength, Supreme Headquarters of the Allied Powers in Europe (SHAPE) have recently made public their appraisal of Russian military strength, stating that in fact the numerical strength of Soviet ground forces has remained constant between 1947 and 1956—approximately 175 divisions. At the same time, it has been recorded, the mobility and

fire-power of all Soviet fighting formations have been increased. 65 divisions of the present establishment are now tank and mechanised divisions.

The total strength of the Soviet armed forces and those of the Eastern European countries now stand at six million men, of whom about four and a half million belong to the ground forces. The report states that 'as yet there has been no evidence that (any) cut has been actually carried out'. In fact, the number of Eastern European divisions, now standing at the figure of 80, has nearly doubled since 1947.

The appreciation made by SHAPE, as far as the land forces are concerned, is that 'the Russian ground potential for a surprise attack on the West would still be great even if the entire cuts were made'.

As regards the Soviet Air Force, three factors have combined effectively to increase its fighting potential, namely, the introduction of jet aircraft not only for fighters but also for light and medium bombers; the development of a comprehensive aviation training programme; and the construction of a large number of air bases with long runways.

Naval strength, as in previous appreciations, lies chiefly in submarines which are still estimated to be about 450 in service. The present naval construction programme includes a number of larger ocean-going submarines.

### **Conventional and Nuclear Warfare**

This appreciation of Communist armed strength has led some Western military leaders to re-orientate their ideas regarding the nature of future war. Although it is obviously not the intention to call a halt to nuclear preparations, it has been advocated that the possibility of conventional war must be given more serious consideration than it has been in recent years.

Nuclear build-up by the rival blocs has come to such a state that both sides might well find it expedient to restrict themselves to conventional weapons so long as there is a possibility of averting a thermonuclear holocaust. If this is accepted, then a future war will almost certainly commence in the conventional pattern and, short of irresponsible 'trigger happy' acts of nuclear reprisal, might well conclude in a conventional truce. If this were to happen, the present state of armament of the Western nations would undoubtedly place them in a position of disadvantage.

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*Two copies are required of all articles sent to the Editor. These should be typewritten with double-spacing, and on one side of the paper.*

## MOBILE DEFENCE

LIEUT. COLONEL V. P. NAIB

"Draw your man into attack — and get him so that he has both hands out of business and you have one hand free."

KID MCCOY

(From *The Strategy of Indirect Approach* by  
Captain B. H. Liddell-Hart)

**E**VER since the Battle of Cambrai on 20th November 1917, when tanks made their first effective appearance on the battlefield, the pattern of war has changed considerably. By breaking through the linear static defensive systems of the First World War, they put an end to the stalemate that had developed and thus introduced into warfare a new factor which promised tremendous possibilities. But the die-hard conservative elements, who refused to see beyond their noses, ignored for some time the new factor of mobile fire-power with disastrous consequences during the Second World War. The decisive role played by armour during that war and the exploitation of the third dimension by air power, both tactically and strategically, have further emphasised the dynamic nature of modern war. These developments, although significant in themselves, have now been overshadowed by the Atomic Colossus! The great powers are already busy grappling with the problems posed by these revolutionary changes.

In my last article entitled 'Striking Force',\* I discussed the importance of carrying the offensive into enemy territory in the case of a limited regional war. But there may be occasions when, either due to the superior military might of the aggressor power or due to the mental inertia of the non-aggressor power, the former succeeds in seizing the initiative and invades the latter's territory. In such an eventuality, the only way in which

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\*USI Journal, April 1955.

the non-aggressor power can defeat the enemy is by adopting the technique of mobile defence. Therefore, the aim of this article is to examine the concept of mobile defence in the context of a modern war. Inevitably, this will involve a re-examination of the current ideas on the theory of defence and certain aspects of organisation and equipment. The problem will be primarily viewed from the point of view of a neutral Asian democracy like India. Military preparedness is inescapable even for a neutral country, and sound and clear thinking on the technique of war we should adopt is an essential condition of such preparedness.

## I. STRATEGICAL CONSIDERATIONS

### HISTORICAL SURVEY

Amongst the numerous occasions when decisive battles have been fought by the successful application of the principles of mobile defence, there are two outstanding examples which merit serious consideration. One belongs to the early Mediaeval History and the other to the recent past. These are the campaigns of Belisarius and the defensive battles of the German armies in Russia under the brilliant leadership of Field Marshal Von Manstein during the Second World War.

As Captain Liddell-Hart has pointed out in his monumental work, *The Strategy of Indirect Approach*, the campaigns of Belisarius are remarkable because of three features — first, the extraordinary slender resources with which Belisarius undertook those far-reaching campaigns; second, his consistent use of the tactical defensive; and third, his army, which was based on the mobile arm as it was mainly composed of cavalry. Whether it was in home territory or in enemy territory, Belisarius disposed his forces in such a way that he invariably allowed or tempted the enemy to attack him on ground favourable to the defence. Once the attack was blunted and the enemy was caught off-balance, "so that a joint became exposed and could be dislocated", he used his cavalry to give the coup de grace.

Manstein's battles in Russia, after the German debacle at Stalingrad, provide convincing proof of what can be achieved

by mobile defence when conducted with skill and boldness. Time and again, although confronted with the on-rush of the victorious Russian armies which were numerically vastly superior in every branch and enjoying air superiority, Manstein converted the very initiative of the enemy to his own advantage. By yielding ground according to a well designed plan, he was able to concentrate his far flung forces with such effect that he repeatedly struck crippling blows against the enemy. The losses suffered by the Russians in men and material became so heavy that their offensive was brought to a standstill. According to the German strategists, a continuation of such tactics would have effectively stopped further Russian advances and given an opportunity for a counter-stroke that would have radically altered the situation.

It is at this point that the reason for the success of Belisarius and the failure of the Germans becomes apparent. Emperor Justinian did not interfere with Belisarius in the strategic direction of his campaigns. Once the aim of the campaign was laid down and the broad lines of strategy decided, Belisarius was free to achieve that aim as he thought best. With the Germans, on the other hand, their failure was due to Hitler's inability to appreciate the strategic implications of the situation combined with his insistence on rigid resistance and refusal to yield ground whatever the cost. This is a tragic example of the effects of holding on to ground for no other reason than that of cove-tousness.

#### THE STRATEGY OF INDIRECT APPROACH APPLIED TO DEFENCE

As this article is an attempt to translate into practical tactics the principle of indirect approach expounded by Captain Liddel-Hart in his famous treatise, it is necessary to emphasise a few strategical aspects of mobile defence. This is particularly important because, the technique of war a nation should adopt is dependent upon the broad framework of its strategy. Without the orientation provided by sound strategical direction, unrelated and isolated tactical successes, however brilliant, are not of much value by themselves when viewed in the bigger perspective of the war as a whole. Germany's ultimate defeat in the last war, in spite of her brilliant tactical successes in various theatres of war, is a convincing proof of this statement.



As Captain Liddell-Hart has observed, pure theory of strategy best fits the case of 'acquisitive' states that are primarily concerned with conquest. In the case of a 'conservative' state intent on maintaining its security, the aim would be merely "to induce the aggressor to drop his attempt at conquest — by convincing him that the game is not worth the candle." Quite apart from this, as the defensive is invariably forced upon a nation due to the aggressor nation's superior military strength and its seizing the initiative, the former is compelled to start the war from a position of weakness. The problem of the 'conservative' state is, therefore, the selection of the type of strategy that best accords with its conservative policy and its military strength. A reliance on static defence and the mentality that goes with it is an open invitation to disaster in any modern war. The best course for such a state is to adopt the 'defensive-offensive method' or, to use a better expression, 'mobile defence'. By adopting mobile defence, as Belisarius and Manstein did, the very weakness of the defensive can be converted into strength and the strength of the enemy into weakness. Given bold and skilful leadership, mobile defence can successfully implement the principle of indirect approach "to foil the other side's bid for victory", which is equivalent to defeating him in battle and achieving one's own aim as already stated. Once that is done, the question of a counter-offensive and carrying the war into enemy territory belongs to the realm of Grand Strategy and its needs to be considered *de novo* at Governmental level in the light of the circumstances then obtaining.

The success of Belisarius and Manstein was primarily due to their reliance on their respective mobile arms, the Byzantine Cavalry and the Panzer Armee, whose speed, offensive action and flexibility were brilliantly exploited by both the generals. It is, therefore, an essential condition that an army carrying out mobile defence must be based on high mobility and strong hitting power. In other words, a 'Striking Force' based on armour, is no less a necessity for defensive operations than it is for offensive operation. The only difference, and a very important difference at that, is the ability of the Striking Force in mobile defence to operate with greater freedom and greater security over familiar

terrain, than during offensive operations in enemy territory. As I have already pointed out in my article on 'Striking Force', the organisation and training of such a force in the correct technique should be undertaken during peace as an essential condition of its military preparedness, by any vigilant state. Its urgency is, however, directly proportional to the degree of threat to national security. This matter is of vital importance because the very survival of the nation may be dependent upon a correct appreciation of this urgency.

#### ORTHODOX CONCEPT OF DEFENCE

The official doctrine on the subject as laid down in the relevant pamphlets can be briefly stated thus: "The aim of defensive operations is to destroy the enemy. Defence is temporary. It is a prelude to offensive action and allows time for the build-up of sufficient strength to make such action possible." This doctrine which is identical with the current British doctrine, is open to serious objections. In the first place, it ignores the vital time factor. It has been possible in the past for nations to build up their war potential after war was declared. This is no longer possible. A holding force based on natural obstacles cannot give us the time for organising our defences and preparing our offensive. As General Fuller puts it: "In an age of supersonic speed and guided missiles, as space shrinks so does the range of striking power increase, so that military time—that is time to operate in—is steadily being whittled down from months to days, days to hours, and hours to minutes". Although General Fuller is thinking of a world war between powers who will use the latest instruments of destruction, we cannot ignore the inescapable truth that, in a modern war, it is no longer possible to trade space against time. Therefore, the defensive must incorporate the offensive both in regard to time and space with the aim of defeating the enemy.

Another objection to the official doctrine is that it seeks to limit the scope of defence as a mere prelude to offence. Such a distinction between defence and offence, as if they are always separate entities in point of time, is very misleading. Many great battles have been decided by a combination of the defen-

sive and the offensive in point of time and space. The outstanding examples of such a combination are the defeat of the Persians at Daras by Belisarius, the encirclement of the Russian armies near Kharkov by Manstein, the Battle of Alam Halfa and the Battle of Medinine during Montgomery's North African Campaign in World War II. The last two battles were primarily responsible for Rommel's defeat in North Africa, although more publicity is given to their sequels, the Battle of El Alamien and the Battle of the Mareth Line, both of which would not have been fought at all but for Hitler's insistence not to yield ground.

An interesting feature of the official doctrine is its aim. As if to compensate for its limited and, in a sense, negative concept of defence, it incorporates the aim of the classical doctrine—"the destruction in battle of the enemy's armed forces". Although the destruction of the enemy's armed forces in one climactic battle as visualised by Clausewitz is hardly ever possible in practice, the classical doctrine comes nearest to fulfilment when offence is combined with defence, particularly in view of the latter's tremendous resisting power with modern weapons. Pure negative resistance by itself would never be able to achieve the amount of destruction that could nullify opposition to the extent of paralysing the enemy's offensive. The deliberate and local counter-attacks in the defensive set up as recommended by the official doctrine may succeed in achieving some measure of destruction, but that would be achieved at heavy cost to the defender who may not be able to afford it. In any case, the result of such a battle would at best lead to a stalemate and not a decisive victory to the defender. This is the real snag in applying the classical doctrine with its narrow aim to modern conditions. It may have been good enough in the Nineteenth Century with the nature of the weapons then obtaining, but it certainly restricts the scope of the land and air forces of today, whose reach and flexibility demand a broader aim and wider objectives than the armies of the last century. The problem is, therefore, how to combine defence with offence in point of time and space in such a way as to compel the aggressor to give up his aim. This should be done in the most economical way by combining the power of manoeuvre of the mobile element of the

land army with the tremendous reach and striking power of the air forces. This is the essence of mobile defence.

#### THE LIKELIHOOD OF THE USE OF TACTICAL ATOMIC WEAPONS

The explosion of the Hydrogen bomb has been hailed by many leaders of military opinion as the biggest deterrent to a total war of the kind we have known twice during the last half a century. It is true to say that regardless of who initiates the attack, the use of thermo-nuclear weapons of mass destruction would mean the annihilation of both the contestants. This would indeed be an extreme case, when one of the belligerents becomes desperate, and loses all sense of reason and human values. As, however, such a catastrophe would mean the end of civilisation, and the two major powers who control these ultimate weapons can be assumed to exercise balance and judgment in spite of their mutual antagonism and distrust, the probability of a total world war can, within reason, be ruled out. But this does not mean the total abolition of war. The present cold war between the two great power blocs and their untiring efforts to extend their respective spheres of influence have been producing, and will continue to produce, what General Gale calls 'peripheral wars' of a limited nature. In such limited regional wars, the use of tactical atomic weapons against targets in the battle area cannot be ruled out. The availability of these weapons to the belligerents depends upon the importance of the issues at stake from the point of view of the Great Powers.

In view of the foregoing, no country can afford to ignore the likelihood of the use of tactical atomic weapons against its defence. Once one of the belligerents secures such weapons from a friendly great power, the other side will also obtain it sooner or later from another source. During this dangerous interval when one of the belligerents has the atomic weapons and the other side hasn't, which is the worst case, the latter cannot afford to pack up and admit defeat. It must be remembered that such weapons are not plentiful and the few that are available with the major powers have been produced at such great expense that their use by others in a limited war would be exceptional. Even in those exceptional cases, their actual

use in battle would be limited both on account of their prohibitive cost and the availability of worthwhile targets, which is itself dependent upon accurate information difficult to obtain during battle. It is, therefore, not beyond the capacity of the non-aggressor power to devise ways and means of meeting such a threat successfully. It calls for superior organisation, thorough training, and skilful and courageous leadership. At the same time, it should not be forgotten that it is the function of diplomacy or statecraft, even during peace time, to provide against such a contingency and reduce the above mentioned interval in war to the minimum.

## II. THE TACTICAL ASPECT

### THE ORTHODOX SYSTEM

"The Infantry Division in Battle" lays down three basic requirements for the successful conduct of defence :

- (a) A comprehensive and co-ordinated defence plan including plans for counter-attack.
- (b) Concealment of our positions, so affording surprise in the event of an enemy attack and reducing casualties.
- (c) Determination to fight it out at all costs, even if some positions are overrun or surrounded.

The third requirement, together with the "spirit of aggressiveness at all levels", is a general statement relating to the morale or the fighting spirit of the commanders and troops. This merely stresses the obvious as it is a condition precedent to the very employment of the armed forces of any nation in war. The clue to the pattern of the defensive battle is, however, provided by the other two requirements. The detailed requirements of the defensive framework like depth, concealment, counter-attack and so on, as described later, are merely the elaboration of the two basic considerations mentioned above. In this type of defence the emphasis is on holding ground and making the defensive layout invulnerable. The concept of the 'vital ground' is mainly responsible for this tying down of troops to the ground and making everything rigid. Even the launching of the counter-attack is made contingent upon the loss

of the vital ground or the threat of losing it. No doubt, vital ground has a certain amount of importance in any defensive battle. But the exaggerated importance attached to it, as at present, is bound to make the whole system rigid and cramp the initiative of commanders. Such a system of defence can hardly be expected to encourage the aggressive spirit.

Too great a pre-occupation with the idea of the vital ground all the way down from the force headquarters to the lowest formation, which is a brigade, will result in missing many good opportunities of hitting the enemy hard. It may even mean missing the rare opportunity for the delivery of the crippling blow to his offensive. With all the ingenuity of the defence in channelling enemy thrust into an organised 'killing ground', the enemy, who should also be credited with intelligence, may choose to by-pass both the vital ground and the killing ground. This type of wide outflanking movement is quite normal when mobile forces operate in open terrain. 'Sitting pretty' in the killing ground and waiting for the enemy to come and sacrifice himself when there is plenty of room for the latter to manoeuvre, is nothing short of wishful thinking. This reminds one of the celebrated story of "the man who gave the powder to the bear" as narrated by Sir Winston Churchill in his memoirs of World War II. "He mixed the powder with great care making sure that not only the ingredients but the proportions were absolutely correct. He rolled it up in a large paper swill, and was about to blow it down the bear's throat. But the bear blew first!"

#### EFFECT OF ATOMIC WEAPONS

Quite apart from its basic flaws and its handicaps even in a conventional war, the orthodox system breaks down when tactical atomic weapons are used by the aggressor nation. "The aim of atomic tactics in battle", as generally accepted, "is to tempt or force the enemy into concentrating his forces to constitute a worthwhile target for the atomic weapon, while at the same time denying such a target to the enemy". In view of this, the present organisation of defence with its divisional sectors is an open invitation to atomic annihilation.

If the experimental atomic explosion at Nevada for testing its effects on troops and equipment in a tactical setting is any guide, troops even when dug in at a distance of 1,500 yards from ground zero would suffer casualties. But an armoured task force called 'Task Force Razor', poised 3,000 yards from the ground zero suffered no casualties and was able to fulfil its mission by driving through the atom blasted area and 5,000 yards beyond to capture an objective. It is not known whether this explosion was designed to demonstrate the effect of an atomic missile fired from an atomic gun or dropped by an aircraft in tactical support of ground troops. In any case, it is not probable that an atomic missile designed for tactical support of ground troops would have a bigger lethal area than 3,000 yards. A more powerful missile, apart from its high cost and the difficulties of accurately locating its target, which is dependent upon battle-field intelligence, may prove to be a hindrance to the troops exploiting the explosion on account of the damage it may cause.

It follows that, whether it is a conventional war or an atomic war, the present system of tactical defence needs a complete reorientation. Its very basis of tying down troops to the ground and making all its operations dependent upon the concept of vital ground needs to be changed. In a future war, there should be greater emphasis upon dispersion, depth, camouflage and concealment, and command and control. There is a desperate need to replace the rigidity of the old system by flexibility in both the dispositions and the conduct of defence. Mobile defence, on the other hand, has all these attributes and its pattern for a conventional war could be easily adapted for an atomic war. This will become clear when the requirements of mobile defence are considered in detail.

#### RESOURCES AVAILABLE

Any military planning which does not take into account the existing and immediately foreseeable resources of the nation would be unrealistic. It was pointed out earlier that the basis of mobile defence is a 'striking force' with high mobility and strong hitting power. In my afore-mentioned article,

'Striking Force' I have discussed in considerable detail the composition and requirements of such a force in a country like India. As, however, the economic and industrial potential of the country will limit the size of such a force, mobile defence cannot be conducted by means of the striking force alone. This will necessitate the employment of the less mobile formations of the Army, although this may make the conduct of mobile defence less elastic. Although the existing resources should always form the basis of all military planning, in a paper like this, it is permissible to suggest changes in the existing organisation including such weapons and equipment as could be procured without undue strain on the country. As the whole problem hinges on anti-tank defence, it is best considered under that heading.

#### THE PROBLEM OF ANTI-TANK DEFENCE

In a modern war, particularly when the terrain is favourable the tank dominates the battlefield. With the likelihood of the massed employment of tanks on a much larger scale than during the last war, the problem of defence will become largely the problem of anti-tank defence. At the present moment our anti-tank resources are inadequate to meet such a threat. Various proposals have been put forward to strengthen the anti-tank resources of the infantry and armoured divisions. The suggestion that the tank should displace the anti-tank gun as a divisional weapon, as it has in fact been done in the United Kingdom and America, is being hotly debated. As this problem affects defence, particularly mobile defence, more than any other operation of war, a correct appreciation of the various factors involved is very necessary.

At the very outset it must be admitted that for a good many years, until such time as we can produce enough tanks indigenously, our resources in tanks would be very limited indeed. As I have already indicated in 'Striking Force', this consideration will determine the character of our armoured organization, the nature of its equipment and the method of its employment. With the existing resources, we can either have a strong and compact striking force by concentrating all our



resources in tanks or we can make some of our infantry divisions very much stronger than at present in their anti-tank resources by decentralising armour to them. We cannot afford to do both. In support of the latter, the argument that the tank is the best anti-tank weapon is not valid. Nobody ever disputes the fact that the 'best means' of anti-tank defence is the tank itself. As Colonel Herman Oemichen puts in his article on "The Crisis of Anti-Tank Defence", reproduced in the *Military Review* of August 1955, the question is whether it is the 'correct means' in all cases. Apart from the fact that we have limited resources, such a dissipation of our most valuable offensive power would make us weak both in the attack and the defence. As the aggressor can concentrate his armour, in point of time and space, as he likes, the defender would generally be weaker locally, even though the latter's overall tank strength was greater than the aggressor's. When the enemy is strong in tanks, the only way to defeat him is to wait for an opportunity to determine the direction of his main effort and then, commit our own armour in mass in a decisive attack under the most favourable conditions. In order to do this successfully all the armour in the theatre of operations must be under one commander.

Once it is accepted that we cannot decentralise armour for the purposes of anti-tank defence, the next problem is to find ways and means of providing adequate anti-tank defence for the infantry divisions. The provision of assault guns which can both support the infantry and provide the anti-tank defence, with all the advantages conferred by their armour protection, cross country mobility and fire power, would appear to be the answer. Their versatility and their cheapness when compared to tanks make them ideal both for the support of infantry and armour. If we cannot afford assault guns, the present divisional anti-tank regiment should be equipped with self-propelled anti-tank guns to meet the needs of a fluid battle. In order to give more flexibility to the divisional anti-tank defence by providing the much needed reserve of anti-tank guns, the addition of a fourth battery of self-propelled anti-tank guns is a necessity. The infantry battalions should be equipped with a suitable light anti-tank weapon of the recoilless type, which can knock out

enemy tanks at a minimum range of 600 yards. In some quarters, it has been advocated that the infantry battalions should be organically equipped with long-range anti-tank guns. This is ruled out on the ground that such a step would make the infantry battalion administratively unwieldy and introduce difficult problems in its tactical functions. At present, there is more need to step up its fire-power by the addition of a platoon of medium machine-guns than burdening it with heavy and cumbersome anti-tank guns.

### III. THE PATTERN OF MOBILE DEFENCE

#### PLANNING

In the light of the above discussion on the strategic and the tactical aspects of mobile defence, including the effect of tactical atomic weapons, the pattern of mobile defence now appears to emerge more clearly. As already stated, the essence of mobile defence is the combination of defence with offence in point of time and space in such a way as to defeat the enemy decisively. As the basis of mobile defence is the striking force and everything hinges on it, the dispositions of the other elements of mobile defence and their part in the battle should be planned in such a manner as to increase the effectiveness of the striking force to the maximum. It will thus be seen that the basic considerations for planning mobile defence are in a sense the reverse of those for orthodox defence as indicated in Part II above. Successful mobile defence depends upon four factors:—

- (a) A well planned layout of strong defended sectors which afford maximum scope for the employment of the striking force. In other words, the strong points should be organised in such a way that they act as fire bases or pivots of manoeuvre for the striking force.
- (b) Maximum dispersion of both the mobile and the less mobile elements coupled with the ability to concentrate quickly in the case of the former and the necessity for 'neighbourly aid' in the latter case.
- (c) A co-ordinated and flexible fire plan to concentrate

all available fire support including air, in spite of the fluidity of the battle.

- (d) Defended sectors must be carefully selected and prepared both to achieve maximum concealment and to minimise the effects of enemy air action and atomic weapons.

The Force Commander, after a thorough appreciation of the entire theatre of operations, must decide what are the likely routes of enemy advance and how the enemy may out-flank the troops blocking those routes. In an eastern theatre, because of the paucity of road communications, major operations will be generally restricted to one or two of the existing main roads. Taking into consideration the natural obstacles, he must choose a zone which is so situated that :—

- (a) it is possible to block or threaten effectively the main routes of enemy advance;
- (b) it has good laterals which enable rapid concentration of the striking force in any threatened sector;
- (c) it does not involve the dispersion of defended sectors to such an extent that they are unable to aid each other and thus become liable to be defeated in detail; and,
- (d) it affords the maximum scope for the employment of the striking force.

Having determined the zone of operations, he will decide on the nodal points, the number of defended sectors and their grouping around each nodal point, and the allocation of artillery, engineers, and other resources available to him. Next comes the most important decision, which is the key to the whole plan. This is the location of the striking force and the plans for its employment, both within and outside the defended zone. He must also decide the location of his own headquarters which includes the tactical air headquarters. The whole plan must necessarily be related to the time factor, because the preparations may include the construction of air-fields, bridges, roads and even railways. This is part of peace-time planning when the zone of operations is within home territory. If mobile defence is to be

undertaken in enemy territory, the preparations must proceed under the protection of a strong covering force.

### REQUIREMENTS

The following are the requirements necessary for the successful conduct of mobile defence.

#### 1. Controlled Dispersion

An atomic missile landing in any part of the present divisional sector would inflict so much damage as to make the division ineffective as a fighting formation. For this reason there is need to have bigger gaps between battalion areas and still bigger gaps between brigade sectors and divisional sectors. With the increase in the fire power of a battalion by the inclusion of medium machine-guns organically, it is possible to have a gap of 1,500 to 2,000 yards between battalions and yet have the gap covered by battalion mortars and machine-guns. After all, the type of 'mutual support' based on the rifle and the light machine-gun as visualised by the textbook is rightly restricted to the company localities within the battalion. Above the battalion level mutual support can only be 'neighbourly aid' by means of the longer range battalion weapons. This will permit of a brigade sector extending upto 5,000 yards. With its units thus dispersed and well dug in the brigade sector will not present a worthwhile target to an atomic weapon.

Between brigades a gap of 5,000 yards would be the maximum, as otherwise, the present divisional artillery will not be able to cover the front adequately and the divisional commander will not be able to re-inforce or counter-attack any threatened portion of the divisional sector effectively. It will thus be seen that a division deployed two up can cover a frontage of over 15,000 yards in three directions and still fight effectively. The advantage of this system is that, while retaining the advantages of a divisional sector in respect of the centralised control of artillery, provision of re-inforcements, and the conduct of counter-penetration and counter-attack, the brigade sectors will compel the enemy to disperse his effort; particularly in artillery. With its increased fire-power and anti-tank resources the brigade sector will be able to continue resistance even when surrounded or penetrated and at the same time inflict severe casualties on the enemy.

From the point of view of the striking force, the above system will prove to be eminently suitable. When a number of such brigade strong points are organised in depth and generally lined together in divisional layouts, it will be possible to dictate the direction of attack for the main enemy force. This method of controlled dispersion in depth will slow down the momentum of his attack by compelling him to mount successive deliberate attacks against the strong and well fortified brigade sectors. During this process, the bulk of enemy armour will get separated from his infantry and provide opportunities for destroying his armour by powerful counter-attacks from secure flanks. Another great advantage of this system is that it provides the striking force with room for manoeuvre both within and in front of the defended zone.

## 2. Location of the Striking Force

The ability of the bulk of the striking force to concentrate quickly in time and space is vital to the success of mobile defence. But the pre-battle concentration of the entire striking force in one location is both undesirable and impracticable, on account of the threat of enemy air and atomic weapons. What is needed is a planned dispersal of the striking force in the area of the depth brigades. One or two armoured regiments may even be located in the forward brigade sectors. In order to facilitate command and control and ensure rapid concentration of these formations it is necessary that their headquarters and ancillary administrative units are located centrally in respect of their own component units. Movement plans for the units to concentrate into their parent formations and the latter into the required strength of the striking force should be worked out in such great detail that the striking force can concentrate quickly in any part of the defended zone as a matter of drill.

It will be noticed that elements of the striking force will be located within or in the vicinity of brigade sectors. This does not mean that the brigade commander or even the divisional commander can commit the armoured unit located in his sector into battle for launching a local counter-attack. To do so he must be specifically authorised by the Force Commander, who will not

normally decentralise armour to subordinate formations. Such a decentralisation may be desirable when a particular formation is given the task of defending an important bridge or some other vulnerable point. The sector commanders must appreciate this limitation on the employment of armour, although the very presence of the armoured units, who will occupy previously reconnoitred fire positions, would be an asset to them in the event of a surprise attack. In an emergency, permission for committing the armoured unit into a counter-attack can always be obtained from its parent armoured divisional commander who should be authorised by the Force Commander to use his discretion in the matter. But this should be a rare occasion in mobile defence. It is, however, different in the case of the armoured divisional artillery as will be explained below.

### 3. Control of Artillery

The control of artillery, even when centralised, presents many difficult problems on account of the extended frontage of the defended zone. This is made more difficult as guns will also be required in depth to hit the enemy who may penetrate the forward defended sectors. In addition to these considerations, the striking force must be supported by the maximum amount of artillery. These conflicting requirements can be reconciled by adopting two measures as indicated below.

The first is to follow the already suggested linking of brigade sectors into divisional layouts and deploy the divisional artillery immediately to the rear of the forward brigade sectors in such a way that they achieve the necessary dispersion and yet are able to concentrate their fire in as wide an arc as possible. For example, in the case of a divisional layout with two brigades up, two field regiments would be deployed inwards in the rear portion of the two forward brigade sectors and the third field regiment would be deployed in the forward portion of the depth brigade sector. In the same manner, even four brigade sectors can be linked together with an additional field regiment. These gun areas should have two or three previously reconnoitred additional gun areas to increase the flexibility and the range of fire support.

The second measure relates to the provision and employment of reinforcing artillery consisting of medium and heavy regiments. The provision of reinforcing artillery will be necessary because, due to range limitations, the guns of the flanking sectors are unlikely to give effective support to their neighbours. In the initial stages, medium guns would be deployed well forward in order to reach well out. Later on, as the battle develops, these would be pulled back to the rear or to the flanks to reinforce any threatened sector or to support the striking force. In addition to the above, the various artillery components of the striking force can be used as reinforcing artillery. This is subject to the proviso that they fire from dumped ammunition and are always free to move with their ammunition echelons full, whenever their parent formations move into battle.

#### 4. Good Communications and Accurate Intelligence

A comprehensive system of signal communications is vital to the successful conduct of mobile defence. What is needed is a message and observation network of a relay type super-imposed on the communication net already linking the defended sectors *inter se* and the Force Headquarters. This will be starting from the mobile reconnaissance elements operating far ahead of the defended sectors and reaching far back into the depths. There should be a continuous and rapid flow of information from the various sources including air, and an efficient intelligence staff to sift and collate the mass of information, draw the correct deductions, and present an accurate and coherent picture of the battle. The rapid command decisions, which are a feature of mobile defence, are dependent upon accurate and timely intelligence.

#### THE CONDUCT OF MOBILE DEFENCE

Lt. Col. Crosby P. Miller, writing on "The Armoured Division in the Mobile Defence" in the July-August 1955 issue of *Armor* says. "Mobile Defence is a flexible defence requiring a highly mobile force, a commander capable of rapid decisions, and a force capable of rapid execution of these decisions." In other words, as I have stated earlier in "Striking Force": "It demands daring and mobile-minded leadership for command and

an efficient staff for keeping the wheels of this mobile force well oiled." The staff should be as mobile-minded as the commander because of the peculiar and difficult problems of mobile defence. In the first place, a correct build-up of the intelligence picture showing the progress of the battle in every part of the zone is vital because, a command decision, in addition to being rapid, must also be the correct decision. Secondly, because of the dispersion of the striking force, its concentration in a fluid battle at the proper time and place presents very difficult problems of movement both during the day and the night. This will call for tremendous powers of organisation, quick thinking and improvisation on the part of the commander and his staff.

The central idea behind mobile defence as Captain Liddell-Hart puts it, is "the use of the baited gambit", which has the psychological basis of "lure and trap". The very nature of the defensive dispositions as described above under the Pattern of Mobile Defence, provides both the lure and the trap. The defended sectors throughout the zone will hold their positions assisted by the fire-power of the longer range weapons of their neighbours and, whenever necessary, by reinforcing the local artillery resources as described previously. Subject to the proviso stated earlier, limited counter-attacks by armour located in the vicinity may also be undertaken. The aim of this defensive battle is to channel the direction of the main enemy advance in such a manner as to create conditions favourable for the action of the striking force. This 'luring' of the enemy is preceded by those elements of the striking force which operate forward of the defended zone as covering troops, whose task is to confuse the enemy in regard to his thrust lines and gain information about his order of battle. In order to increase the effect of the gambit, it will be necessary for some of the defended sectors "to roll back with the punch". This will be done deliberately to the flanks of the enemy advances, where the brigades occupy previously prepared positions and thus further strengthen "the haunches of the break-through" as General Martel advised the Russians in their efforts to trap and destroy the mass attacks of German armour during the Second World War.

Having got the bulk of the enemy attacking force mainly



consisting of armour thus hemmed in, the stage is set for the decisive blow. Here two alternatives present themselves to the Force Commander. He could launch his Striking Force against one or both the flanks of the enemy from secure pivotal positions within the defended zone and destroy the enemy. Alternatively, he could launch it in the area of the initial enemy break-through and develop further operations in two directions after sealing off the haunches. The bulk of the striking force will be employed to hit the enemy from his rear and flanks and destroy him, while a smaller but powerful force will be employed to cut the enemy's communications and to capture his headquarters and administrative areas. Of the two, the latter alternative is to be preferred because it aims at the psychological disruption of the enemy command, which is more unbalancing and far-reaching in its effects than the former. This course of action confers a greater degree of freedom of action for the striking force. Eventually, it is bound to achieve the aim of defeating the enemy with the minimum of expense to ourselves.

Throughout these operations it must be stressed that the primary task of the air force is to achieve local air superiority or, at least, prevent the enemy air from interfering effectively with the movements of the striking force. Tactical air support against targets in the battle area should be arranged whenever possible. Another very important contribution of the air force to the success of mobile defence is continuous tactical reconnaissance. The successful launching of the striking force against any wide outflanking move of the enemy outside the defended zone is very much dependent upon adequate air support and early information.

### CONCLUSION

The technique of mobile defence is essentially the application of the principle of indirect approach. Strategically, defence may be forced upon a nation which is compelled to fight from a position of weakness as the victim of aggression. By adopting the technique of mobile defence, such a nation can convert its weakness into strength and defeat the enemy decisively. "The key to mobile defence is the Striking Force". The success of

mobile defence depends upon the skilful combination of the power of manoeuvre of the Striking Force with the tremendous resisting power of a well planned system of defence. The latter should be designed to provide the maximum scope for the successful employment of the Striking Force.

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## BATTLE-WORTHINESS OF UNITS IN STATIC AREAS

BRIGADIER G. I. S. KULLAR

**I**T is not possible to maintain the real battle-worthiness of units in peace at all times. The best that commanders can hope to do is to ensure a thorough and, as far as possible, continuous training in battle procedure and unit administration. This training should culminate in intensive manoeuvres where units and formations are exercised in a number of operations of war under conditions approximating as nearly as possible to the strains and stresses of a battlefield. A unit which carries out these manoeuvres successfully and earns a satisfactory report from its superior commander during his annual inspection, may be considered as fit for war. No unit can be declared unfit for war unless its discipline is bad, its morale low, its interior economy faulty and its weapon handling and shooting poor. There should be very few such units if there are reasonably good officers in them. A unit is the mirror of its officers. More often than not when a unit is declared unfit for war on account of poor training, it is really a stricture on the commanding officer's fitness to hold command.

Like any other concentrated human activity, it is not possible for men and units to remain fighting fit and ready for war at all times. Even the best of units have to be put through an active and intensive period of training before they can take the field. How long a unit takes to get ready for active service will depend on its role immediately preceding mobilisation. A unit on Internal Security duties, for example, will take very much longer to be really fit for battle compared with a unit which forms part of a field formation in peace time. Again, there are some units such as workshop companies, signal units, transport companies and many others whose peace and war roles are almost identical. Such units profit rather than lose from their sojourn in a static formation.

## NATURE OF DUTIES IN STATIC FORMATIONS

It has been suggested that in the case of several units that have been declared unfit for war, one of the causes has been that they were part of a static formation and had limited opportunities for training. It is true that as units in a static formation have to perform a host of somewhat unmilitary duties, the men do not get ample time to train and in the process they lose their potential fighting efficiency. Again, if a unit is spread in small detachments over a large area—as is often the case—training suffers badly and any form of even minor collective training is well-nigh impossible.

Some of the duties which are peculiar to units in static areas are listed below :—

- (a) Provision of large and numerous escorts and guards of various sorts.
- (b) Provision of guards of honour, ceremonials, large working parties and fatigues.
- (c) Assisting civil authorities to maintain law and order and in the maintenance of administration in times of floods, earthquakes and other natural calamities.
- (d) Maintaining essential services in times of strikes.

It is not possible to do away with these duties as the raising of special semi-military units to take over such tasks will not be acceptable to the Government owing to the prohibitive cost involved. Also, a peace-time army being such an unproductive instrument, it should legitimately be used for such duties to justify the defence budget in peace. It should also be employed on other nation-building projects and the consequent lowering of standards in the units' potential battle efficiency accepted. So long as this affects only a portion of the army, no harm will be done. It is felt that we should not expect a standard of "push-button battle readiness" at all times from the whole of our army but only from our field force. A lower standard of battle-fitness among units in static formations should not be an adverse comment on their commanders. So long as a unit is physically fit, can shoot its weapons, can maintain its equipment and mobilisation stores in good order, has a workable interior economy and

satisfactory morale, all should be considered well with that unit. It will not take long to make such a unit battleworthy when it leaves a static formation to join an active brigade.

#### SUGGESTIONS FOR KEEPING UNITS FIT FOR WAR

Having accepted the position that the training of units in static formations must, in the nature of things, suffer owing to the irksome and somewhat non-military, but nevertheless essential, duties they have to perform, and also sometimes owing to the lack of proper training areas, let us see what steps can be taken to cut down the training difficulties of such units so that they can train as much as possible and thus keep up their potential fighting efficiency. An Infantry battalion station in a Sub Area is taken for the purpose of illustration.

#### Distribution of Duties

The General Officer Commanding an Area should so distribute escort and other standing duties among his limited number of battalions—perhaps two or three in an Area—that a unit is concentrated for training for at least four months in the year. The men should march to a suitable training area for their company and battalion training even if it happens to be a hundred leagues away from their cantonments. This active period of four months should be devoted to training as under :—

- (a) half a month for intensive basic training;
- (b) one and a half months for section and platoon training;
- (c) two months for company and battalion battle training and field firing culminating in two or three long exercises to assess the battalion.

#### Range Classification

The other eight months of the year should be spent on normal garrison duties, fatigues, ceremonials, routine training, leave, escort duties, guards and the many other duties to be met with in a static formation. The annual range classification should also take place during these eight months. This classification must be of an honest kind and not like the one we often see these days where 100% results are "produced" and all are passed.

### **Inspection**

The annual inspection of the unit should take place during the last week of the platoon training period before the unit goes out to camp. It should be a proper, live and thorough affair and not a perfunctory one — too common these days. The visit should be a proper inspection and not a sort of social visit to the battalion. More emphasis should be laid on training rather than on minor administrative details by visiting officers. Let the inspecting officer see the guts of the battalion and not its cellar.

### **Training Films**

More training films should be shown to troops. In this way, certain aspects of training, which limited opportunities in a static formation do not allow to be put into effect, could be exhibited to the troops with great advantage. A projector and a projectionist should be included in the establishment of a battalion stationed in a static formation.

### **Officers' Training**

During the slack period, the Commanding Officer should concentrate on the training of his officers. He can do this with greater care provided his officers remain in the unit. More often than not, most of them are away on station duties and courses. There is a general feeling among Commanding Officers that we are overdoing these courses and that many courses are held merely to keep the establishment of a School of Instruction going. It is felt that the time has come to look into the frequency and in some cases the necessity for these courses. It should never be necessary to force course vacancies on a unit. It may be mentioned that pre-war, an officer did one course in every three or four years; the more an officer stays with his unit the better it will be for all concerned.

### **Station Duties**

Unlike his predecessor, the present-day junior officer has to perform a host of station duties, the most irksome of which is the station board detailed to check incoming and outgoing railway wagons containing rations and stores. Why cannot we trust our supply officers to do this; after all it is their legitimate duty. If the supply officer cannot be trusted, a system should be

devised whereby the contractor delivers the *atta* and rice in every military station. The less officers are employed on these station duties the more will they be with their units and the better will consequently be the training of their men.

### **Audit Boards**

Officers' boards to audit accounts of units are held quarterly. These are station boards and a large number of officers spend a lot of their time on these boards. It is no exaggeration to say that they dislike these boards. It is felt that where a unit's assets amount to rupees ten thousand only, its accounts should be audited quarterly by a unit board. A station board should be convened to audit accounts of units half-yearly where the total assets of a unit do not exceed rupees fifty thousand. Where the assets of a unit are over fifty thousand, such accounts should be audited by civilian Chartered Accountants. The adoption of this procedure will make our officers available for training their men.

### **Training with Other Arms**

The necessity for a battalion to train with other arms, such as Artillery units, Engineers and Armoured Corps units cannot be over-emphasised. But such supporting units are seldom to be found in static formations. Commanders should therefore give greater attention to the efficient running of skeleton exercises and tactical exercises without troops so that officers may keep up their knowledge of battle procedure and movement technique.

### **CONCLUSION**

Such then are some of the important measures which should be followed to keep active units in static areas reasonably fit for their fighting roles. These measures are easy to adopt and can be put into effect without major changes in the role of these units. A certain lowering of fitness standards must be accepted. It cannot be helped owing to the nature of duties they have to perform and the limited opportunities for training that they have. While it is true that "a unit fights as it trains" it is also true that a unit becomes unfit for war not due to lack of training alone but due to lack of discipline, esprit-de-corps, morale, physical

fitness and bad interior economy. In fact, conditions in a static formation are far more conducive to the maintenance of better discipline and morale than is the case in an active formation in peace time. An analysis of the comparative crime figures will bear out this assertion. If a commanding officer in a static area can ensure that his unit does not suffer from indiscipline, poor morale and bad interior economy, his unit will never be sentenced as unfit for war and he will find it easy to train it up to the required standard once he joins an active formation.

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## THE EVOLUTION OF ARMoured FORMATIONS

R. M. OGORKIEWICZ

**A**T a time when changing technological and operational conditions raise the issue of future Army organization it is appropriate to examine the evolution of armoured formations in order to establish clearly their principal characteristics and, if possible, the general trends which might serve as useful pointers to further development.

To establish any general pattern the subject must be viewed in its proper perspective which in this case stretches as far back as World War I. It was then, or rather shortly afterwards, that the idea was conceived of permanently organizing tanks and other arms into operational units which have since been classified as armoured formations.

One of the very first formations incorporating tanks was that proposed in 1919, in Britain, by General Fuller. Considering his other far reaching proposals General Fuller's "New Model" division was of a surprisingly conservative pattern and in view of its peculiar mixture of foot, horse and tank elements could hardly be regarded as a very promising proposition.

Three years later a much more adroit type of organization was put forward by Captain Liddell Hart. His division consisted of three composite mechanized brigades, of two tank battalions, three armoured infantry battalions and self-propelled guns, each of which as well as the division itself represented a well balanced armoured fighting team.

However, neither of these two organizations was given a trial. General Fuller, at the time the foremost tank theoretician, veered towards the idea of armoured forces composed almost entirely of tanks and this idea dominated the field for several years afterwards.

The basic idea of an "all-tank" field force had already been suggested in 1916 by General Martel. It was largely inspired by the "landship" concept of the tank, a concept which visualised the tank as the equivalent of the warship on land. Originally the "landship" concept was useful in freeing the tank from the bonds of trench warfare in which it was born but, inevitably, it tended to divorce tank forces from the realities of ground warfare and laid too much emphasis on the tank and its employment by itself.

In the twenties the "landship" idea was superseded by another, namely that of armoured forces as the mechanized successor to the already defunct horse cavalry. This was a more homely concept and was beneficial to armour from the point of view of mobility. But the "cavalry" concept also channelled the development of armour into the rather limited roles to which horse cavalry had been reduced and because of its somewhat restricted outlook again favoured the employment of tanks by themselves.

#### THE TANK BRIGADE PERIOD

Apart from the operational theories, the organization of armour was, of course, also greatly influenced by the available resources. Thus, during World War I, when tanks began to be produced in quantity, the size of tank units grew rapidly from companies to brigades. But when the war ended not only did further expansion cease but actually drastic reductions were made in the total strength of the tank forces. Thus, for several years afterwards, a single brigade represented the total British tank strength and no other army had a tank unit larger than a regiment.

The brigade, however, matured. In Britain it developed from being little more than an administrative grouping of tank battalions into an operational unit. Most of the ideas and experiments of the late twenties and early thirties were centred on the tank brigade and this became the generally accepted basic tank organization. The British example was followed by the Soviet Army, which built its powerful armoured forces on the basis of tank brigades, and the first American mechanized for-

mation, the 7th U.S. Cavalry Brigade, was also essentially a two-regiment tank brigade.

In the thirties both Britain and Russia began to form even larger bodies of tanks. In Russia these were called corps and embraced three tank brigades. In Britain this was the Mobile Division which was organized in 1938 on the basis of one medium and two light tank brigades but which was replaced a year later by the Armoured Division with one light and one heavy tank brigade.

All these formations had other troops apart from tank units: the British Mobile Division, for instance, had two motorised rifle battalions and the original Armoured Division a Support Group with artillery and one rifle battalion; the Soviet corps had a motorised rifle brigade. But the proportion of infantry to tanks was at the very most one to three and the position of these units was insignificant in relation to tanks. All these formations were, in fact, little more than collections of tank brigades and were still dominated by the "all-tank" ideas, which General Fuller was propagating as late as 1943 and which characterise the first period of development of armoured formations.

#### COMBINATION OF ARMS AT DIVISIONAL LEVEL

The essential weakness of the "all-tank" ideas was their tendency to overlook the limitations of the tank and their failure to recognise or acknowledge the need to complement tanks with other arms. This was also the weakness of the organizations governed by the "all-tank" ideas and was particularly serious if the employment of armour was to extend beyond the limited role of the classic horse cavalry to that of a versatile fighting arm.

As early as 1916 the French formed special units of *infanterie d'accompagnement* to support tanks. Subsequently tank-infantry cooperation in the French Army degenerated into a complete subordination of tanks to the infantry and it was partly to escape this fate that tank forces in many countries tried to develop on their own. In the long run, however, there was

no escape from the need to complement tanks with infantry and other arms. In consequence, from the early thirties on, attempts began to appear at combining the different elements together. At first these consisted of *ad hoc* attachments of other units to tank brigades; later they gave way to the more sensible permanent grouping at divisional level. Almost invariably the divisions thus formed were based on a tank brigade to which had been attached an infantry brigade or its equivalent.

The first formation of this type was the *Division Legere Mechanique*, formed by the French cavalry in 1934. This formation was actually evolved by a process of slow mutation from the horse cavalry division and was still largely regarded in terms of the limited roles of horse cavalry. Nevertheless, organizationally, it had the characteristics of the versatile armoured formations of all arms which came to the fore in the succeeding ten years.

The next and undoubtedly more successful example of the latter type was the German Panzer Division, brought to life in 1935. Like the *Division Legere Mecanique*, the Panzer Division was based on a tank brigade supported by a motorised infantry brigade and this type of organization became widely accepted in the early stages of World War II. It formed the basis of the Italian and Japanese armoured divisions and in 1942 it was also adopted by the British Army which retained it until recently. It was also the basis on which the first U.S. armoured division was formed in 1940, consisting as it did of an armoured brigade backed by a two-battalion motorised infantry regiment.

The chief characteristic which distinguished these formations in what might be regarded as the second phase of the development was that they no longer tried to rely almost entirely on tanks but, instead, on a combination of various arms. Admittedly, some of the earliest—such as the original Panzer Divisions of 1935 and the American armoured divisions of 1940—still had nominal tank strengths almost in keeping with the earlier “all-tank” ideas. But the balance between tanks and other arms was quickly corrected and they all contained a sizeable infantry component.

For instance, the original 1935 Panzer division had 4 tank battalions, with a nominal total of 561 tanks, to 3 rifle battalions. But by 1939 the ratio was altered to 4 to 4. During the war further increases in the proportion of the infantry took place, though this was largely due to shortages of tanks. As a result the balance swung the other way and the number of infantry units exceeded that of tanks and this was usually accompanied by the addition of various other supporting units, particularly of artillery. Consequently the 1941 Panzer division had 5 infantry battalions to 3 or even only 2 tank battalions; from 1942 to 1945 the ratio was 4 to 2. A similar ratio applied to the 1942-45 British armoured division which had 4 infantry battalions to 3 tank battalions.

The low ratio of tanks to infantry in the 1941-45 Panzer division made it almost into an infantry formation and was, in fact, no higher than that in the 1942 British infantry division which had one tank brigade to two infantry brigades, or 3 tank to 6 infantry battalions. This ratio was clearly inadequate for an armoured formation and meant that in action only a part of the divisional infantry could be effectively combined with tanks. To make the situation even worse the cross country mobility of the two elements differed considerably, the infantry being usually provided with trucks with limited off-the-road performance. In consequence, tanks and infantry tended to fight on their own instead of cooperating closely and complementing each other.

To achieve the proper degree of integration between the two basic elements of armoured formations it is, of course, essential that they and any supporting arms have roughly the same degree of mobility under all conditions and that their relative strength is properly balanced. The former was never achieved during World War II, although American armoured divisions of 1943-45 came fairly close to it with the whole of their infantry in armoured half-track carriers and the whole of the divisional artillery self-propelled. In the case of the British and German armoured divisions of the same period, however, only one out of the four infantry battalions in each division was equipped with armoured cross country vehicles and could thus

cooperate closely with tanks.

As far as the proportion of infantry to tanks is concerned, experience and logic showed that the best balance was achieved when the strength of the two was roughly equal, or, in other words, when there was one tank battalion to one infantry battalion. This was actually the case with the majority of the German Panzer divisions in 1939-1940 and of the American armoured divisions in 1943-45.

#### CLOSER TANK-INFANTRY INTEGRATION

By comparison with the "all-tank" armoured formations of the first phase the formations of the second phase, with their integration of all arms at divisional level, possessed much wider capabilities and acquitted themselves well in a variety of defensive as well as offensive roles. However, in action the combination of various arms at divisional level did not prove sufficient. True, several set-piece battles were fought by whole divisions but the great majority of armoured actions were fought in tactical groupings of smaller size.

A variety of factors contributed to the development of these small-size inter-arm tactical groupings. One was the size of the armoured divisions in relation to the terrain which often prevented them from operating in one body. Coupled with this was the fact that in mobile operations tanks and infantry which were not kept fairly close together seldom had a chance to come up and support each other in time. Then there was the growing power of modern weapons and particularly that of the tactical air forces which made it essential to operate in far smaller bodies than a division. In fact, by the end of World War II, the Germans had found that in face of air superiority such as they experienced on the Eastern Front, in Russia, battalions were the largest bodies of troops which could be safely deployed and in Europe in 1944-45 often only companies.

Even before World War II a few proposals were made to combine tanks, infantry and artillery below divisional level. One notable example occurred during the gestation period of the *Division Cuirassée*—the French infantry's 1940 armoured division. It was, however, the Germans who were the first to

recognise clearly the advantages of operating in mixed tactical groupings and exploited it in their highly successful *Kampfgruppe*, or battle groups, of brigade, battalion or even company size.

Nevertheless, the Germans did not carry this development to its logical conclusion and did not reorganize their Panzer divisions in keeping with this method of operating in mixed tactical groupings of smaller than divisional size. This was left to the American armoured divisions which abandoned the original brigade-based organization in favour of self-contained battalions and combat command headquarters capable of assuming command of any combination of battalions.

The combat commands, which were equivalent in status to brigade headquarters, were created in 1942 and the whole system of combat commands and self-contained battalions was firmly established with the 1943 reorganization. It was used successfully by the American armoured divisions in the latter part of World War II, when it was also adopted by the French Army. Since the war it has been adopted by the Italian Army and more recently by the German Army, as well as being retained in a slightly modified form by the U.S. Army.

#### THE BATTALION BATTLE-GROUP

As with the German *Kampfgruppe*, the mixed battle teams of the American armoured divisions did not, in practice, stop at combat command or brigade level. Task forces or combat teams of battalion or company size showed that even smaller tactical groupings were both required and practical.

In view of this it was almost inevitable that in time a new type of organization should appear which combined tanks, infantry and other arms at even lower level—of battalion at least. Examples of this have existed for some time in the reconnaissance battalions of several armoured formations but it was not until after World War II that this type of mixed organization was extended to other units. For want of a better term the new unit might be called a heterogeneous battalion—as opposed to the earlier homogeneous type—and its appearance marks a

further and fourth stage in the evolution of the organization of armour.

The first of the new units were the American light armoured cavalry regiments and the tank regiments of the Soviet tank divisions. The former are essentially independent light armoured brigades and consist of three battalions each with one tank company, one assault gun company and three reconnaissance companies of light tanks and riflemen. The latter are roughly equivalent in armoured vehicles to Western tank battalions and embrace a small infantry battalion, as well as assault guns. A third and more recent example is the French *Regiments Inter-armes* which consist of two tank, three rifle and one heavy mortar companies.

The first two of the above units actually appeared before the advent of tactical atomic weapons which have put a further premium on relatively small self-contained battle groups and have thus given much greater emphasis to the trends already apparent by the end of World War II. All three of the above organizations—American, Soviet and French—are still relatively new and the heterogeneous battalion is by no means fully accepted yet. For instance, the experimental armoured division organization introduced by the British Army in 1955 is based on homogeneous armoured regiments and little else. However, this return to the “all-tank” ideas represents clearly a regressive trend and while much remains to be done the principle of the heterogeneous battalion is eminently sound.

First of all the heterogeneous battalion aims at the closest possible integration of riflemen with tanks and other self-propelled heavy weapons. This alone can ensure that the two elements—the heavy crew-operated weapons and the individual fighting men—can complement each other effectively at all times.

Secondly, it is in line with the general trend in the organization of armoured formations over the past thirty years. Thirdly, it is in keeping with the need to operate in relatively small battle groups brought about by atomic and other modern weapons.



## CONCLUSIONS

Looking back once more over the four phases of the development of armoured formations, it is clear that the general trend has been towards progressively closer integration between tanks and riflemen. The first phase introduced tanks at the operational level and was characterised by the "all-tank" ideas and the tank brigade. The second phase was marked by the recognition of the need to supplement tanks with other arms and their combination at the level of an armoured division. In the third phase the combination of tanks with infantry and other arms moved below divisional level and the typical organization consequently consisted of self-contained battalions which were combined into mixed tactical groupings of brigade size. The fourth and current phase has introduced the heterogeneous battalion capable of acting as a self-sufficient battle group. This is the logical outcome of the progressive trend towards closer integration between tanks and riflemen demonstrated in the first three phases of the evolution of armoured formations and it fits in, at the same time, with the requirements of this age of tactical atomic weapons and cold wars.

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## THE DEFENCE ASPECT OF INDUSTRIAL LOCATION

LIEUT COLONEL R. D. PALSOKAR, M.C.

**T**HE second five year plan lays stress on the industrialisation of the country. Of the total anticipated outlay of Rs. 4,800 crores, we are to spend Rs. 1,400 crores on building new industries and developing the existing ones. Of this huge amount, the lion's share has been set apart for iron and steel manufacture. New steel plants are already under construction at Rourekela in Orissa, and Bhilai in Madhya Pradesh. Talks are now in progress for the establishment of one plant at Durgapur in West Bengal. Yet another is contemplated to be built at Mysore. We are also investing heavily in the manufacture of electrical equipment, cement and chemicals, fertilizers and aluminium. Cement production is to be raised from 4.6 million tons in 1955-56 to 10 million tons in 1960-61. Aluminium production is to be raised eightfold—from 5 thousand tons in 1955-56 to 40 thousand tons in 1960-61.

Industrial development brings material prosperity in its wake. It is but natural, therefore, that different states press forward their claims for the establishment of new industries within their boundaries. Not long ago, when the Centre announced their decision to establish a steel factory in Rourekela, there was considerable heart burning or more appropriately perhaps, considerable agitation in Madhya Pradesh. When one was at last sanctioned for Madhya Pradesh, West Bengal felt that it was being neglected. There is thus a possibility of the defence aspect of industrial location being overlooked or relegated to the background in this clamour for the establishment of industries in certain states.

In western countries, industrial development took place over a period of the last hundred years or so. When new concerns were established during peace time, the primary consideration invariably was economic. Seldom, if ever, was the

defence aspect given any thought. During wars, the defence of industries was left to the genius of the generals. Now that we are planning where to locate what in the next few years, it would appear logical that we examine now whether it would be feasible to afford protection to such industries in case of aggression.

The aim of this article is, therefore, to examine the defence aspect of industrial location in India bearing in mind the other factors which govern such location. This examination would be facilitated if we considered what factors govern industrial location and how they conflict with defence requirements. It would then be possible to make suggestions for the location of new industries in the country.

#### FACTORS GOVERNING INDUSTRIAL LOCATION

The chief factor governing the location of an industry is economic. The businessman works out where it would be cheapest for him to manufacture a finished product and sell it at a profit without incurring heavy expenses on its transportation. According to Weber, transport costs in terms of ton-miles of both the raw materials and the finished product determine the location. Thus, Tata Iron and Steel Industries are located in Jamshedpur near the source of raw materials, or more scientifically near the source of localised materials such as pig iron and coal. Localised materials (i.e. materials which are available only in certain places) and particularly those like coal which lose weight in transit tend to attract industries to their sources of supply. If, however, it is too expensive to transport the finished product to the market, it may be cheaper and hence profitable to manufacture it near the market. Thus, an industry may be located near the source of raw materials or the market depending on the transport cost in terms of ton-miles.

Once an industry takes root in an area, it produces a large number of skilled workers who do not like to migrate to other places. Subsidiary industries grow in nearby places thus facilitating quick repair or replacement of machinery. Banks understand the particular business and finance it. Entrepreneurs are thus attracted towards such a locality and a particular industry

becomes localised there. The cotton textile industry in Bombay and Ahmedabad can be cited as an example of this type of localisation. Of the 400 odd cotton mills in India, over two hundred are located in Bombay island and Ahmedabad. This has been mainly due to the credit and banking facilities available and due to Bombay being a natural harbour—not because the raw material is available in or near Bombay. Bombay in fact depends upon Khandesh and Berar for its cotton.

Another cause of industrial localisation can be termed psychological. Knowledge of industrialists as regards transport costs in ton-miles is not always very accurate. They see industries flourishing in one locality and are drawn towards it in the hope of getting suitable returns on their capital and efforts.

It stands to reason, therefore, that if the cost of transportation is reduced, industries may be located away from the source of raw materials as well as away from the market. The cost of sea transport is particularly low. Its effect on the British steel industry is well worth noting. Unlike India, though Britain is not self-sufficient in raw materials for steel making and has, in fact, to import large quantities of iron ore from far off countries like Sweden, North and West Africa and Newfoundland, her finished steel products cost less than those manufactured in India. Crude steel production in Britain is constantly on the increase. From 10.4 million tons in 1938, it jumped up to 19.5 million tons in 1955. This has been possible due to cheap cost of transportation coupled with savings effected by technical development in the manufacturing process.

#### FACTORS OF DEFENCE

These factors should be considered broadly as 'defence in a world conflict' and 'defence in local wars'.

We will assume that with our policy of non-involvement in power blocs we will avoid providing targets for nuclear weapons. Attacks with conventional weapons will remain a probability. In either case our industries should be dispersed and located as much inland and as far away from enemy air bases as possible.

While considering defence in a local war, it should be remembered that India will not resort to arms except in self-defence. Her armed forces are also organised to defend her against external aggression. In case of an aggression, a reference will be made immediately to the United Nations who would certainly intervene initially to localise the war and later to end it as quickly as possible. It is reasonable to assume that by the time effective action is taken, we would have fought hard at least for three weeks to a month. It is this fighting with which we are concerned most.

In this type of war which will be fought with the tactical know-how and weapons of the last world war, we should be able to defend our industries. This type of war, though lasting for such a short duration, is likely to harm our industries to such an extent as to relegate it by five to ten years. And this may exactly be the aim of the aggressor.

It is not possible to defend the borders by manning a continuous line of defence, or by constructing obstacles and covering them by fire. An aggressor normally succeeds in penetrating the defence by striking in overwhelming strength on a narrow front. During the last world war, the defences of the Maginot Line were penetrated at one such stroke. The depth of penetration depends on the momentum of the initial thrust, the capacity of the attacker to regroup his forces for further offensive and his ability to stretch his lines of communication. The attacker heads for strategical objectives which may be air-fields, ports, centres of communications, important industrial areas or bridge-heads for further operations. It therefore follows that the industrial areas should be well away from the likely strategical objectives such as air-fields and ports and out of reach of the attacker's initial thrusts.

Modern defence against conventional weapons visualises formation of mutually supporting localities in depth to absorb the momentum of enemy attack before it reaches the vital areas these localities are meant to protect. The enemy is counter-attacked when he reaches a certain degree of exhaustion or when he outruns his communications. The depth of his pene-

tration will depend on the defender's ability to arrest its progress and bring it to a standstill.

Yet another operation in conjunction with his land thrust may be launched by the enemy to maintain the momentum of his attack. His airborne troops may be dropped, behind the defender, at a distance from the main area of operations, to secure further advance as a result of joint efforts by the two forces. The airborne troops can also be used to destroy industrial plants on the coast as they can be easily withdrawn by sea after the raid.

It will thus be seen that considerable space near the border may have to be sacrificed in the initial stages so as to retain the initiative. Coast-lines and ports are also particularly vulnerable to attack and these areas should be avoided for industrial location. If the source of localised materials happens to be within these areas, the establishment of industries nearer their markets should be considered. The other alternative would be to establish in such areas industries the loss of which will not affect the material war effort.

A still greater threat to industries is from the air. In the second world war, when the Allies were meeting with reverses all over the world in land, sea and air battles, their air forces were giving due attention to the destruction of German industries. German industrial cities in the Ruhr and the Rhineland received particular attention from the British Bomber Command under Air Chief Marshal Sir A. Harris. As the Allies recaptured the air-fields in Italy, the oil plants in Hungary, Austria and Roumania were brought within the effective range of the Mediterranean air forces. The freedom of France and Belgium made possible a greater degree of accuracy in attacks deep inside Germany by depriving the Germans of warning and defence in depth. Cologne, Essen, Bremen and Dusseldorf were subjected to thousand bomber raids. Hamburg, the second biggest town in Germany with its biggest shipbuilding yards, was practically completely destroyed. The famous Krupp works at Essen, Skoda works at Pilsen, Zeppelin works at Friedrichshafen were heavily damaged.

Though India is not likely to be so heavily attacked in a local war, the examples of the air attacks in early 1942 on a few secondary targets of the last war are worth mentioning. The Renault factory in Paris was at short range and almost undefended. It was totally destroyed. The submarine building yards of Lubeck were attacked by 234 aircraft which dropped just 144 tons of incendiaries and 100 tons of explosives. Half the town was burnt. The Heinkel factory in Rostock was devastated in four attacks on four consecutive days with a total of only 521 sorties.

Thus, the effect of heavy bombing on industrial targets coupled with the destruction of communications by air attacks had a devastating effect. In the words of Lord Tedder, "here was economic warfare driven home to the point of economic collapse and with it political and military collapse".

To meet this threat of strategic air bombing, the majority of German workers were shifted to bomb-proof shelters or reinforced cellars, or rehoused outside the main cities. Nearly all light industries, especially those making ammunition, small arms, radio equipment, and all types of accessories and components for tanks, aircraft and vehicles, were dispersed in small towns or removed to Central or Eastern Germany. The Ruhr-Rhineland area was no longer the concentrated arsenal it had been in the first four years of the war. On the other hand, the heavy industries could not be shifted and hence suffered heavily.

Complete destruction and dislocation of an industrial and economic system is not possible by small-scale attacks. Repeated concentrated attacks in time and space are essential. However, sufficient damage to put the clock back by a few years can be caused even in a local war. Whether it be a total war or a local one, we should so locate our industries that we should not be required to shift them during war. We should learn a lesson from what the Germans were compelled to do in the midst of fighting and now, during peace, so plan the location of our industries that we can protect them better in war.

Whilst the navies are engaged in their primary task of

keeping the sea routes open for bringing in essential supplies, and guarding the coast, the enemy naval forces can attack important ports and help their land forces in mounting amphibious operations. The aim of such operations is the eventual capture and opening of a port for the maintenance of the forces that have landed and advanced inland. It follows, therefore, that industries should be located as far away from ports as possible.

The Government is alive to the necessity of dispersing the industries. The Licensing Committee set up under the Industries (Development and Regulation) Act, 1951, is armed with the necessary powers to control the location of industries. The committee has already sanctioned the shifting of some sugar factories and is trying to stop further localisation of the textile industry. But a lot more remains to be done.

In the first five year plan, stress was laid on the development of agriculture. The aim then was to make the country self-sufficient in food. This aim was achieved and in the process a number of irrigation projects were executed. A few big dams are still under construction. This type of improvement in the national economy does not hurt others. On the other hand, in the next five years the country is investing heavily in developing her industries. Thus, as the national wealth increases, there is more to protect and there are greater chances of the country attracting aggressors. In such circumstances, consideration should be given not only to the proper location of industries but also simultaneously to planning an increase in the expenditure on the armed forces. This increase may be looked upon as insurance premium for the amount being invested. With more funds, the armed forces can be stronger in men and material, and more mobile.

#### CONCLUSION AND RECOMMENDATIONS

In the next five years we are to spend Rs. 1,400 crores on the development of our industries. The location and localisation of industries is determined by economic and psychological factors—the cost of transportation being the chief economic determining factor. In case of India having to defend herself against external aggression, she will be at a disadvantage ini-



tially, as all democracies are. Moreover, the concept of modern defence accepts penetration and there are possibilities, therefore, that the aggressor may advance a few score miles before being checked. Localised industries nearer boundaries are vulnerable to strategic air bombing. Given sufficient depth, it is easier to defend them against air attacks. Ports are vulnerable to sea attacks.

Most of India's major industries are located in or near Bombay and Calcutta. The Licensing Committee of the Government is authorised under an Act of Parliament to control the location of industries.

In addition to reducing the transport costs, the Government should—

- (a) persuade/compel entrepreneurs so to locate the industries that the heavy basic industries are in the heart of the country and those producing consumer goods in border states ;
- (b) disperse industries, particularly those producing armaments, to smaller towns ;
- (c) make a serious attempt to shift a few industries away from Calcutta and Bombay and check further localisation in West Bengal.

Let not posterity say that we neglected the defence aspect of industrial location in our second five year plan.

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## THE QUEST SOUTHWARDS

LIEUTENANT D. A. KAMATH, I.N.

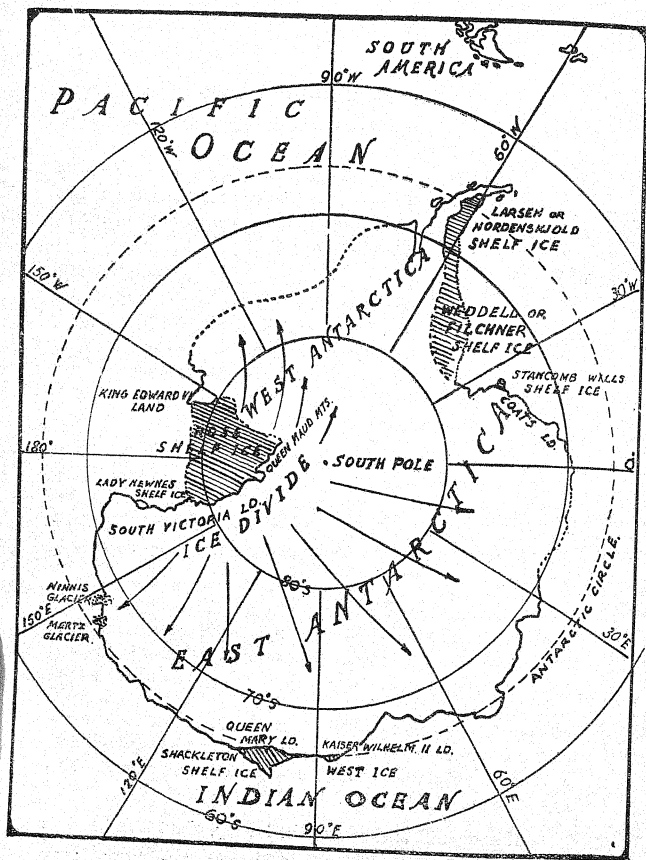
The Northern waters of the Indian Ocean lap the friendly shores of peninsular India whose triangular shape juts out into the ocean. The vast coastlines of Africa and Arabia, of Burma, Indonesia and Australia share the no less friendly embrace of its waters.

Across the ocean almost 5,000 miles away to the south lies Antarctica cold and frigid; with nothing friendly about it. India spread out to the south of Asia and linked by a chain of islands, large and small, to Antarctica is in a sense its neighbour. It is natural then that the continent itself and the many activities there should interest us.

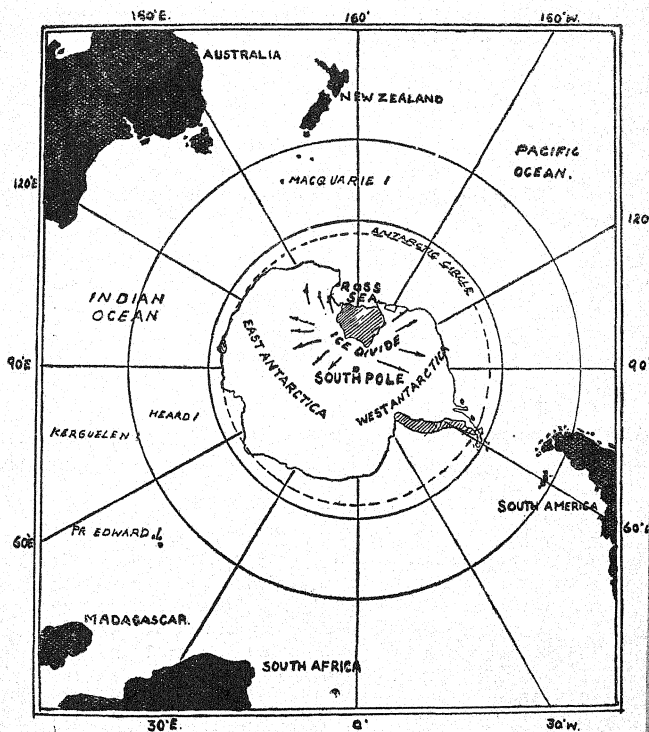
The Antarctica regions consist of Antarctica which is the actual continent extending from the South Pole to approximately the Antarctic Circle and Sub Antarctica which is the area between the continent and the southernmost limits of the mainlands of New Zealand, Australia, Africa and South America.

A few figures will give an idea of its size. The continent is 5,000,000 square miles in area—the size of Australia and Europe together! Its coastline—such as it is—is 14,000 miles long; almost twice the width of the Pacific Ocean! And withal it is one vast expanse of ice. In some places this ice is 2,000 feet thick. Fringed by huge walls (of ice) rising to 4,000 feet or more this continent may be likened to a huge fortress. Over vast areas of the Southern Ocean, this ice breaks off into fragments giving birth to icebergs which float about the ocean for miles around. This fragmentation is interesting.

The greatest thickness of the ice cap, about 11,000 feet, is in the vicinity of the Pole itself—the Ross Dependency area. Owing to its own tremendous weight the ice moves slowly outwards, gradually diminishing in thickness. Finally on reaching



ANTARCTICA



the coastline and beyond with its thickness reduced to about a thousand feet, fragmentation in the form of icebergs takes place—the result of further forcing out over the sea. During the long winter months (March to November) a belt of pack ice 30 feet thick and from one hundred to a thousand miles in width girdles the continent providing 'defences in depth' to an already well defended fortress. Since ice floats with as much as 4/5ths of its volume below sea level the size of this pack ice may be imagined.

The summer sun melts vast areas along its northern fringe. Nevertheless enough remains to make navigation a hazardous venture even during summer.

Whereas the North Polar region is a vast ice covered ocean with great land masses all round it, the South Polar region is a continent with icy peaks some of them 21,000 feet high and volcanic, challenging the biting Polar gales and blizzards. This land with its eerie silences between these gales and blizzards; its yawning crevasses; its long cold wintry nights; its terrifying loneliness; its haunting majesty; its perpetual gloom—is Antarctica the great ice continent of the South.

## II

It is a little difficult to associate such a wilderness of ice with habitation as we know it. In such abnormal environment with temperatures as low as  $-50^{\circ}$  F it is not surprising that except for a few hardy sea birds and sea animals—penguins, cormorants, fulmars, albatrosses, whales and seals among them—which occasionally visit its shores in summer there is practically no life. The region being so inhospitable, it could hardly be otherwise. Indeed the 'mysterious far South' is of the dead; not of the living.

The Himalayas, a massive mountain range in itself, is but a speck compared to the Antarctic wastes. Nevertheless the problems of Himalayan expedition and Antarctic exploration are rather similar. The terrors of the Beardmore glacier only a hundred miles from the South Pole itself are no less gripping.

Even after crossing it, Pole bound, and reaching King Edward VII plateau the trials of the intrepid explorer do not end. It almost seems as if they were only beginning! The notorious Polar gales spring up and developing into blizzards come tearing down on an already near exhausted explorer, threatening to bury him in a shroud of ice and assure him of safe keeping for geological ages!

Is it surprising then that Antarctica remained unknown for so long? Its very existence was unknown let alone its closely guarded secrets. Less than 200 years ago, New Zealand 1,200 miles away, was believed to be a part of some great South Land! Kerguelen, the French explorer in the 1750's, referred to the existence of 'the Central mass of the Antarctic Continent'—long before he had even crossed the Antarctic Circle! Mistakes in identification and location were frequent and many. But these mistakes proved to be most useful for they set the minds of other explorers thinking of these regions.

Thanks to the brilliant voyages of Captain Cook in the latter half of the eighteenth century, the mysterious Antarctica was no longer so. At least its existence was confirmed though perhaps not its exact location. On 30th January 1774, Captain Cook in the 'Resolution' with 'Adventure' in company reached 71° 10' South latitude—the farthest southerly point yet reached. 'I will not say,' he had said, 'that it was impossible anywhere to get farther South, but attempting it would have been a dangerous and rash enterprise.' Not so much because of the pack ice of which there was plenty but continuous bad weather and fog had made life on board extremely miserable and navigation difficult.

Only a year before on 17th January 1773 the historic crossing of the Antarctic Circle had been made by this same navigator.

It was not pure adventure alone, but also 'the desire to establish the whereabouts and character of land masses in the Southern Ocean' that attracted him and others there.

Bellingshausen the bold and intrepid Russian explorer sailed from Rio in 1819 to enlarge on Cook's already considerable

achievement. Bellingshausen Sea is named after him. He was rather cautious in his claims. On a return visit to this sea in the same year he 'saw a black patch through the haze—I knew from my first look through the telescope that land was in sight—only some rocks and cliffs, where the snow could not hold, showed up black. Words cannot describe the delight which appeared on all our faces at the cry of land! land!' Peter I Island was sighted for the first time—the first land to be definitely sighted south of the Antarctic Circle.

More names come to mind. John Biscoe, a retired Captain, the first explorer to sight the actual continent in November 1830, John Balleny and (during 1838 and 1842—momentous years for Antarctica) Admiral Dumont d'Urville the Frenchman, the intrepid American navigator Captain Wilkes, Foster, Sir James Clark Ross, Nares and Sir Douglas Mawson from Australia.

It must be emphasised that until the 1850's all these explorers were restricted to the actual sighting of the land. Landings were to be made later.

### III

Not for another 50 years or so until 1895 was the first landing on the continent of Antarctica made.

What feverish activity this continent and the oceans surrounding it has seen since? Captain Cook and his contemporaries opened as it were the Gateway to the South. But it was Scott and Shackleton and Mawson, Nordenskiöld and Amundsen a hundred years later who entered this gateway and dared to peep into the new wonderland.

Attempts to spend the winter on the continent were made for the first time in 1899.

During the twenty years from 1894 the coastline was being mapped, charted and named. It was literally strewn with tiny habitations in some cases consisting of a few tents and no more. It was typical of the explorers to take possession of the explored land, tiny dots though they were, in the name of their particular King or Queen.

Thus British explorers discovered King Edward VII Land, King George V Land, and Queen Mary Land. The Norwegians established Queen Maud Land, Crown Prince Olav Land, Princess Martha Land and so on. The Germans established Kaiser Wilhelm II Land. There were, of course, exceptions; Bay of Whales for instance named by Amundsen, Weddel Sea, Ross Sea, John Biscoe Bay, Wilkes Land and even Cape Disappointment for the over optimistic!

The Americans not having Kings or Queens, preferred the names of their own great explorers and scientists or their wives! Names such as James W. Ellesworth Land, Marie Byrd Land, and Roosevelt Island began to enter the sacred precincts of Royalty. There was also 'Little America' near the Bay of Whales for the very nostalgic!

And then in 1910 the great race for the South Pole began. British and Norwegian explorers vied with each other for the honours.

It was a great race. One of the greatest in the annals of exploration and adventure. On the 18th of December 1911, Captain Roald Amundsen after a tremendous and exhausting dash reached the Pole. He was originally bound for the North Pole, but en route hearing of Admiral Peary's success there, he altered course and headed South.

His great contemporary Captain Robert Falcon Scott, R.N., and his gallant colleagues Dr. Edward Wilson, Lieutenant Bowers, Captain Oates and Petty Officer Edgar Evans had long since planned their expedition. Lieutenant Shackleton had on January 9th 1909 reached the farthest South yet reached—97 miles from the Pole itself. Captain Scott was keen to do the remaining distance to the Pole. In a hurry they left their base in New Zealand taking ponies instead of the trusted dogs. On 2nd November they started on their great march southwards.

Two months and sixteen days later, on the 16th January 1912, they reached the Pole. Approaching the Pole they saw in the dim distance a black flag fluttering in the gale. It was the Norwegian flag. A note from Amundsen was also there—'Welcome to ninety degrees.'



Sad and heavy at heart, they turned homewards. None of them—cruel fate—were destined ever to reach home. A series of misfortunes ended up with terrible disaster for the party.

The 1914-18 war years saw an increase in the activities in Sub Antarctica. Whales, Sperm Whales in particular, were much sought after both in the northern hemisphere as well as in the southern.

Sub Antarctica was one of their favoured haunts. The whaling industry thrived on their periodic visits and made enormous profits. More so in wartime. Their oil was badly needed for the manufacture of nitroglycerine for explosives.

After that war a new factor entered the scene and has dominated it ever since. The use of aircraft revolutionised the means of transport and aerial photography enabled vaster areas to be covered in relatively shorter time.

On 28th November 1929 Admiral Byrd flew over the South Pole for the first time. Then Sir Douglas Mawson, the Australian explorer, leading a British-Australian-New Zealand Antarctic Research Expedition (B.A.N.Z.A.R.E.) during the next two years added much to the already considerable knowledge of this region, and much of the earlier expeditions' observations were either confirmed or rejected.

In 1935 the American aviator Lincoln Ellsworth made his third unsuccessful attempt to cross Antarctica by air.

But the contribution to the study of Antarctica since the Second World War has been the greatest during its relatively short history. In 1946 the veteran explorer Admiral Byrd led another expedition—the biggest so far, consisting of 13 ships including the Aircraft Carrier 'Phillipine Sea,' 4,000 personnel and a 6,600 ton ice-breaker. With special cameras the naval aircraft made many operational flights covering wide areas and discovering mountains up to even 21,000 feet high. This height when added to the thickness of the 'ice-cap' make them perhaps the highest mountains in the world.

Nineteen hundred and fifty-six. International Geophysical Year is but a year ahead. Antarctica is today a hive of activity. Thirty-nine nations have established bases there. Setting out from their little tents, they are busy exploring the continent. Not on the surface only but digging deep (below the ice cap) for coal and oil and other minerals. Botanists and zoologists are busy finding out whether Antarctica can help replenish the rapidly dwindling supply of food stocks in a world where the population is increasing in inverse proportion! The wealth of marine life around the continent may partly solve the problem. But there may be other sources as well. Also it is believed that the earth's atmosphere is getting warmer! If so, its effect on sea level owing to the melting of Antarctic ice is also to be studied. Vast low-lying coastlands stand the threat of being submerged!

The U.S.S.R. is already taking a keen interest in Antarctica. A Soviet Antarctic base has been established at Mirny in what is known as the Australian Sector. Their helicopters are also coming into the picture.

A relic of the Ice Age, Antarctica fascinates us in many ways. Like a magnet it draws scientists—geologists, biologists, glaciologists, doctors, meteorologists, botanists—and just plain adventurers to its vast dismal regions. They, brilliant in their own respective fields and to a certain extent authorities on their subjects have brought back a wealth of information about Antarctica. So much more, however, remains to be known.

The accounts of the study of Antarctica glaciers and glaciology, marine biology, whales and the whaling industry, Antarctic seals and birds, formation of pack ice and icebergs; meteorology and air and sea navigation; the formation of Aurora Australis; ionosphere and of the researches carried out by the various expeditions make fascinating and interesting reading, having been written by men qualified in every respect to write them.

In "Introducing the Antarctic"\* John S. Cumpston refers to 'the special importance of the Polar regions as fields for meteorological investigation for they contain the ends of the earth's axis of revolution and are also poles of the general circulation

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\*From *Antarctic Today*, Edited by Frank A. Simpson.

of the atmosphere. The study of cosmic rays will be of value, as the number of rays reaching the earth's surface is greater in polar latitudes than in latitudes nearer the Equator. These rays furnish the only means of studying the earth's magnetic field at any point distant from the earth's surface, as well as changes produced in that field by magnetic storms and other disturbances. It may be expected too that telecommunication will benefit from a study of the effect of the Aurora Australis on radio transmissions within Antarctica.' More and more the attention of the world is being drawn south.

#### IV

With all these activities in Antarctica by the many international expeditions during the last sixty years and more, one may ask 'What of India?' In the course of our long history, during the Gupta period of the North and the Pallava and Chola periods of the South, in particular, the Indian Ocean was the world's greatest shipping highway. The presence of many islands, now known as Laccadives (Laksha Dwip), Maldives (Mal Dwip), Chagos, Mauritius, Crozet, and Kerguelen islands suggests that these may have been used as stepping stones in the quest southwards. But there are no records; no accounts of travellers to or explorers of these regions.

One may therefore take it that no Indian has yet stepped foot on Antarctica.

Will at least the 1960's witness the departure of an Indian Expedition on a quest Southwards?

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## MINE WARFARE IN FEATURELESS TERRAIN

MAJOR M. R. P. VARMA

**T**HE influence of geography on tactics is apt to be overlooked during peace-time manoeuvres. Little concern need be shown over what might take place outside of the divisional or corps boundary in the exercise setting—indeed, to do so is frequently to invite censure! On occasions this has led to a lack of realism in both dispositions and unit organisation. As far as Defence is concerned, the most cursory study of campaigns reveals that the choice of ground is a major factor: a defeated force is rarely in so happy a position that it can break contact and withdraw for a hundred miles or more as at El Agheila or El Alamein.

The tactics of the defender are particularly difficult in situations such as the largely featureless border between France and Germany or the present north-west frontier of India. In past invasions of India, by land from West Asia, the invader had either pushed right across the plains of Punjab to Delhi or had been thrown back across it as far as Afghanistan or Kashmir. Where should the commander stand and fight? The strict answer of military geography and history is that we should either thrust deep beyond the featureless terrain or withdraw to our limit of the plain. The solution of a 'Magenot Line' may be dismissed without further discussion. Obviously, we must at some stage, to be clearly laid down in operational plans, undertake a deep offensive across the plain. However, initially, because of our political policies we may well be deprived of the military initiative. A deep withdrawal is politically unacceptable and would also involve heavy losses in manpower and material. Therefore we are faced with a major defensive battle in featureless terrain, the most difficult of all Defence situations.

The tactical problems arise out of a lack of natural obstacles to either Infantry or Armour; movement is possible almost everywhere and even axes of maintenance are flexible as the

density of roads and good tracks is as high in the Punjab as in many parts of Europe and better than anywhere else in Asia, with the exceptions of Java and the main islands of Japan. Cover from ground or air is sparse and it is not possible to conceal a force larger than a brigade from aerial observation. The only obstacles are the great rivers and the extensive canal network. Except when in spate, these rivers are not particularly formidable obstacles while their banks and surrounding country do not confer on a defender similar advantages as parts of the Rhine and Vistula, to name only two other great rivers. These obstacles are entirely foreseeable as is the required Engineer effort to overcome them. Movement is possible almost everywhere and any part of a river or canal 'line' that is held will certainly be outflanked. The choice of a defended position is to a large extent arbitrary as far as obstacles are concerned; rather, it depends on the depth of penetration acceptable from the combined points of view of civilian morale and the mounting of our own offensive.

The only examples of successful defence under similar conditions in modern war are the operations of both the German Afrika Corps and the British Eighth Army at various times during the Middle East campaigns of World War II. In all other cases a break-through to mountainous terrain or to the sea was achieved as by the Germans in France, the German thrust through the Ukraine—rather like the Punjab in more respects than one—to the Caucasus and the thrust of the Fourteenth Army across the Meiktila Plain. In the Middle East, successful defence was based on the laying of millions of mines in very deep fields. In other words, mines were used to create tank obstacles *in the same depth as would be found by the ideal natural tank obstacle*.

The great advantage of the mine is its cheapness: it is not only cheap to produce but it is also comparatively cheap in manpower to cover by fire. The limitations are that, once laid, it is static while its transportation and laying make very heavy demands on transport, labour and time. It is generally recognised that in featureless terrain, defences should be based on deep anti-tank minefields covered by mobile tank and mounted Infantry patrols, by anti-tank guns as well as by Armed Reconnaissance sorties from the air. What is not properly appreciated

is that to be effective these mines must be laid in the density and depth required to make them equivalent to a deep natural obstacle: *this is nothing less than 800 yards to 2 miles!* Is this possible? Can mines be produced in such numbers? Can they be transported and laid in such huge numbers?

The divisional requirement of mines is a finite calculation. By an application of the Theory of Games—widely used in United States strategical and tactical estimates of this type—the pattern and density of minefields can be determined. The required depth is determined by calculating breaching capacity and the period that an Infantry battalion with supporting arms will be able to hold its position against the scale of attack envisaged. Within this period, counter-action by our own Armour, aircraft and other divisional and corps resources will be brought to bear.

Although it is clearly a command responsibility, mine problems are more often considered at the College of Military Engineering or, in abstract, at Administrative exercises; and yet, as has been shown, they are a key tactical device, especially in the type of Defence that we are bound to undertake. Using a team of officers with sound campaigning experience drawn from the Infantry, Armour, Engineers, IAF and Artillery working with Defence scientists, the mine, anti-tank gun and other fire power requirements can be estimated accurately. I do not propose to hazard a guess at the number of mines required: it is to counter such guesses that this article is written. What must be made clear is that the number of mines required is very large indeed—remember the numbers of mine laid at El Alamein and Alam El Halfa.

The only effective use of mines in open terrain is as suggested above. The correctness of this policy is to be decided by—

- (a) industrial capacity to produce mines in the numbers required;
- (b) the feasibility of distributing and laying mines in the number required by corps and division.

The manufacture in large numbers of a metal anti-tank mine with a simple detonator and elementary anti-lifting device

presents no technical or production difficulty. The movement by rail of these mines from factory to field depot presents no particular problem.

The distribution of mines within the corps and division is, however, a difficult problem. Any increase in mechanical transport must be assiduously avoided as it adds nothing directly to fire power. The use of the railway or requisitioned civilian transport cannot be taken as a basis for calculation. The solution must be found from within existing resources. First of all there must be a plan of dumping and collection using available first and second line transport organised by Q staffs. Every Infantry vehicle can carry a proportion of anti-tank mines; similarly Engineer vehicles. These measures will be inadequate. The vehicles of the Corps Bridging Company, ASC should be utilised. The bridges and boats should be off loaded — they are not required until after the defensive battle — and the considerable number of vehicles, with their large platforms, can be used to carry mines forward. Tank transporters can also be used.

The laying of mines in such large numbers will require a technique of its own. We must first ensure that we are laying our mines on the most advantageous pattern; other armies have discarded the pattern that we continue to use. Then, mine laying drills within divisions will need revision: entire depth battalions, even the entire depth brigade, must turn out for mine laying instead of by sections and platoons as at present. The Engineers should be equipped with a simple mine ploughshare for mechanical laying — there are any number of tractors in the Punjab. NCC, NVF, TA and Pioneer units must master this extensive mine laying technique.

The correct application of mine warfare in featureless terrain is given above. A certain vagueness in relation to the pattern, depth and number of mines is unavoidable not so much on grounds of security but because this concept has not been given practical trial. It is suggested that this be done, under carefully chosen teams, during the next manoeuvre season.

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## WITH AN INSECT SURVEY EXPEDITION IN THE HIMALAYAS

MAJOR E. A. VAS

**E**ARLY in 1955, I had read a short newspaper account which reported that Professor M. S. Mani, Professor of Zoology and Entomology, St. John's College, Agra, was once again to lead a scientific expedition to the Himalayas. I at once wrote to him introducing myself and requesting to be included as a member of the expedition. I explained that I was neither a qualified scientist nor a mountaineer, but assured him that I could be of assistance for the general administration of the camp. I also asked for likely dates and the approximate cost of my share of the estimated expenses.

Much to my delight, I received a most friendly and hopeful letter from the Professor, who assured me that he would appreciate having my services in an administrative capacity but that the choice was not entirely in his hands. The expedition although led by Professor M. S. Mani, was being partly sponsored and financed by the Government of India. My name had therefore to be approved by the government before I could be officially included as member of the party. In the mean time the Professor gave me the provisional dates of the expedition and I applied for and was sanctioned leave during May-July. By March I was told that I had definitely been included in the team and I began preparing for the trek.

I had been instructed not to worry about messing, transport or accommodation, as this was being organised centrally. I restricted my personal kit and bedding to under 70 lbs, i.e. a little under half a standard mule-load. This presented no special problems. A valise, sleeping-bag, ground sheet, battle-dress, leather jerkin, a few drill trousers and cotton shirts, woollen underwear and a jersey pull-over, cap comforter, scarf, gloves, snow-goggles and boots, were all items that at once came to mind and were readily available to me. A pair of shorts and canvas shoes,



although hardly standard items for high-altitude wear, proved most valuable for general use around camp. The civilian members of the expedition were similarly equipped. In addition, they had specially made Chinese-pattern padded coats and trousers.

#### THE LAND OF GLACIERS

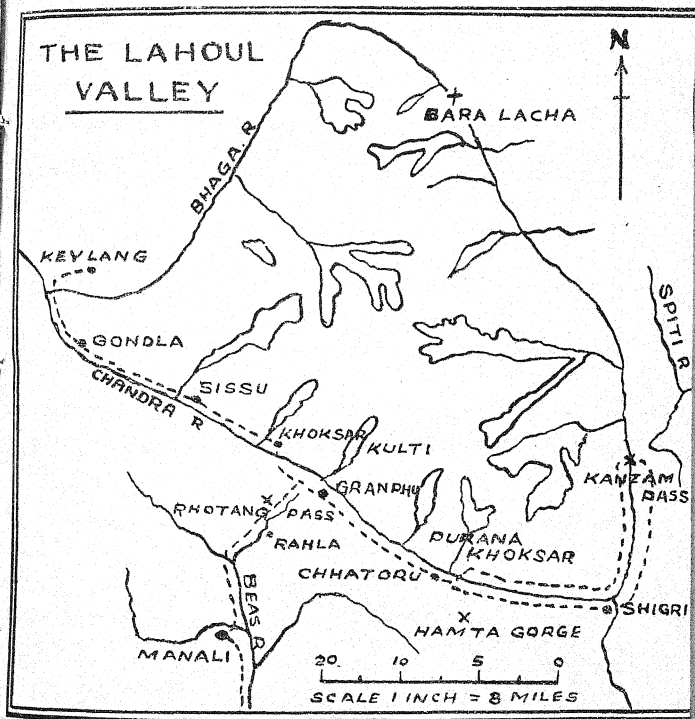
Lahoul is a waziri or canton of the Kulu Sub-division of Kangra District. It is separated from Kulu Valley in the south by the Great Pir Panjal Range and from Ladakh in the north by the Main Himalayas. It is bounded on the west by Chamba State and on the east by Spiti, so named because the Spiti river, a tributary of the Sutlej, rises here and flows southwards.

The river Chenab, which flows through Lahoul, is formed here, by the confluence of the two ice-cold roaring torrents, Chandra and Bhaga. Both these tributaries have their sources near the famous Bara Lacha Pass. These tributaries merge together to become the River Chenab at an altitude of 10,000 feet, four miles below Keylang, the centre of Lahoul Buddhism, Lamas, monks, jummos (nuns) and annual devil-dances. The population in the Lahoul Valley is about 10,000, or less than 6 persons per square mile.

Between the Bhaga and Chandra, lies an isolated mass of mountains, consisting of one almost unbroken ice-field, with at rare intervals, impassable barriers of naked rock. South of this mass, glaciers stretch downward, some over ten miles in extent. The hills on either side reach up to 20,000 and 22,000 feet high, and flank the valley on every side except along the narrow outlet of the Chenab.

In such a waste of rock and ice, villages can be planted in only a few favoured spots in the lower or western valley of the Chenab. Thus Chandra valley naturally falls into two parts, with Khoksar as the dividing point. Western Lahoul is warmer and more densely inhabited while eastern Lahoul is almost entirely uninhabited, except for a few weeks in the summer, when Kangra Shepherds bring up their sheep for pasturage.

The summer is almost rainless but there are heavy snow-falls in winter, the whole area being covered by snow from December to April. The Lahoul Valley is mentioned as early as



the 7th Century by Hiuen Tsiang, the Chinese pilgrim, who makes mention of it by the name La-hu-lo.

The Lahoulis hold in their hands the trade between Ladakh and Central Asia on one side and Kulu and Kangra on the other. Of a total area of over 2,000 square miles, less than 5 square miles are cultivated. Barley forms the principal crop. The grain produced is not sufficient for local consumption, being supplemented by imports from Kulu. Large numbers of traders pass annually through the valley driving their pack animals, goats and sheep, laden with pashm or shawl, wool, borax and cloth. On their return journey they bring metal vessels, sugar, rice, tobacco, pepper and spices.

The women of these parts are of sturdy build and do all the work in the field and home, whilst the men drink beer. It is usually easy to tell whether a woman is from Lahoul or Spiti, by the distinctive differences in dress. Although both plait their hair into numerous little pig tails, the Lahoul ladies wear a silver 'chot' ornament on top of their heads. A married Lahouli woman will also wear two yellow amber balls, as an ornament in her hair, at each temple. They wear a loose Mother Hubbard type of shirt with a girdle and coat. They usually wear brighter colours than their Spiti sisters, who seem to prefer purple, dark red or blue colours.

The Spiti women also plait their hair in the same fashion, but an unmarried girl will always wear a bluish-green sapphire ornament in her hair, above the centre of her forehead. Tibetan women, who look very much the same, never plait their hair and are thus easily distinguished. The men from the Lahoul Valley generally wear a costume similar to that worn by the hill-men of Himachal Pradesh, a typical Dogra churidar pyjama and a coat. The dress of the men from Spiti is very similar to that worn by the Tibetans, viz a loose woollen outer gown, woollen trousers and padded snow-boots. Here again the men seem to show a preference for the darker shades.

#### THE WESTERN HIMALAYAS

My first meeting with the other members of the expedition was on 17 May at Agra. Here I met Professor M. S. Mani and his

son, who was accompanying us on holiday. The professor was no stranger to the Himalayas. In 1954, he had led a small private entomological survey expedition to the western Lahoul Valley. This year he intended surveying the eastern parts of the valley. We planned to cross the Rohtang Pass and keeping to the left bank of the Chandra River, move east and then north to the Kanzam Pass.

Lahoul and Spiti are situated in that portion of the Himalayas generally termed the western Himalayas, and are flanked by the Great Pir Panjal Range to the south and the Main Himalayas to the north. Parts of the valley are about twenty miles from the Tibetan border as the crow flies. Few of us appreciate how different the western Himalayas are from the eastern Himalayas. (I believe that the Geological Survey of India goes so far as to classify the Himalayan chain into four distinctly different sectors.) There are no peaks above 22,000 feet high in the western Himalayas. The few that are above 20,000 feet are still unnamed, unsurveyed and unclimbed. In the eastern Himalayas, one finds a large number of peaks over 24,000 feet. Again, the approaches to the Main Himalayas in the west are difficult and extensive. The depth of mountainous terrain to be traversed is far more. Several intervening ranges and valleys have to be crossed and one cannot glimpse the peaks of the Main Himalayas from a distance, as one can the eastern peaks from distant hill stations. For example, our journey from Pathankot to Manali was 200 miles and involved the crossing of Kangra Valley, the Dhauladhar Range with peaks of over 16,000 feet and Kulu Valley. On reaching Manali, we were still left with the task of crossing the Pir Panjal Range and were yet out of sight of the Main Himalayan peaks.

Yet another factor that seems to have kept mountaineers away from the western Himalayas is the absence of reliable local porters. The few that are available are unable to shoulder the loads normally carried by his eastern Sherpa counterpart. It is interesting to note that the RAF Mountaineering expedition that were climbing in the Spiti at the same time as we were, had brought Sherpas with them from Darjeeling and were not using local porters. These are perhaps some of the major reasons why

the western Himalayan peaks have had little of the glamour or news-value associated with the eastern Himalayan peaks.

The principal aim of the expedition was to collect fauna and flora from the western Himalayas at altitudes above 12,000 feet so as to study the adaptations of various species in different environments at high altitudes. The expedition also intended to analyse the water of various streams in the area in order to determine the oxygen content and current factors and study how these in turn affected the surrounding fauna and flora. Yet another task was the recording of cosmic rays on nuclear plates at various altitudes above 14,000 feet. It was also explained to me how a study of the fauna and flora on either bank of any of the Punjab rivers in the plains, if continued to their source in the hills, indicates that the types of fauna and flora found at high altitudes are not palaearctic, as one would have expected. The same tropical species that are found in the plains, are found with adaptations at high altitudes. The findings of our expedition were hoped to reinforce the geographical and geological theory that the rivers of the Punjab are antecedent rivers i.e. rivers that existed before the Himalayas existed.

#### WE ASSEMBLE AT MANALI

By 19 May we had reached Pathankot and after halting there for one night, left the next day by special bus for Manali. We had over one ton of scientific equipment and food with us. We halted for one night at Kulu en route and continued the next day to Manali. Here we halted up to 24 May whilst mules and porters were arranged for and our final administrative details tied up. All members of the expedition had reached Manali by now. Besides Professor Mani and his son, there were five others excluding myself. Mr. Santok Singh, Mr. H. N. Baijal and Mr. V. K. Gupta were three research associates from St. John's College. They were all specialists in various species of insects and hoped to write a thesis after this expedition in order to earn their Ph.Ds. Then there was an Englishman, Mr. R. V. Charley, Lecturer in the Chemistry Department, St. John's College. Mr. Charley was a keen mountaineer who had some experience of rock climbing both in UK and Europe. He had accompanied the

Professor on his trip the previous year and was our strongest climber.

In addition to performing the duties of ration quartermaster, Charley was also planning to expose nuclear plates at high altitudes in order to study the effects of cosmic rays at these heights. This meant scaling high peaks on our journey, leaving nuclear plates exposed on the peak for about a month and then climbing up the peaks again on our way back in order to collect the exposed plate. (These exposed plates were eventually packed and sent to Aligarh University for detailed study).

The last member of the expedition was Dr. A. P. Kapur of the Zoological Survey of India. Dr. Kapur was a Ph.D. from Cambridge University and had spent four years at the British Museum, London. He was a man of wide interests and proved to be an admirable companion. Professor Mani acted as official photographer. He had the most up to date cine and still-photography apparatus with him and was able to carry out field developing on the spot.

We had twenty mules and hill ponies (of which only nineteen were load carriers), one cook, two porters and four mule drivers. The hill ponies and mules of these parts are advertised as being able to carry over 200 lbs. Readers are warned to plan on not more than 140 lbs. per mule for long marches. Eight of our mules were loaded with food alone. Although we were only eight members, we included the cook as our ninth member as he was not a local and had been brought by us from Agra.

Food for nine men for three days was packed into one box. The advantage of this system is that only one box need be opened every fourth day. A typical day's menu started off with hot coffee at 5 a.m. in the morning. By 6 a.m. we would all be out of our tents ready for breakfast. This would consist of hot suji halwa well sprinkled with raisins and nuts, a wedge of cheese, biscuits or purees and tea. On some days bacon and biscuits would be served as substitutes for halwa. Lunch was at 12 noon. This consisted of dhal, potatoes, onions, pickles and rice or chappatis and was followed by coffee. Afternoon tea was at 4 p.m. when biscuits and jam, pakoras or a fruit bar were served

with hot tea. Dinner was very similar to lunch with the addition of some tinned vegetable. Every other day, tinned meat (sausages or corned mutton) was served as additional fare. The day was rounded off with hot Ovaltine or cocoa as a night-cap. Multivitamin tablets, butter and glucose were taken every day.

Four mules were loaded with bedding rolls and kit. The remaining seven mules were loaded with scientific equipment, tents, medical stores, library and so on. As a ration box emptied, it was filled with specimens collected and so there was never any wastage of mule-space. The twentieth mule was for the use of the mule drivers. In addition to this mule, they invariably distributed their bedding and tents as top-loads on the less heavily loaded mules. The mules were paid for at the usual rate of Rs. 4-8 per mule per marching day and Rs. 2-8 per mule per day whilst halted. The porters were paid at a flat rate of Rs. 4-8 per porter per day.

The porters and mule drivers had their own tents, beddings and rations. Being locals, they had no difficulty in making local purchases of such items as goat's milk or butter from way-side shepherds. In addition to this, they carried their own stock of parched barley, tea and gur, of which they make their staple concoction, called Suttu. They eat this as a paste, using a simple stick to scoop the mixture into their mouths from a bowl held close up to the face. This could be one explanation of how the use of Chop-Sticks eventually developed in China!

In addition to suttu, the locals also carry dried meat with them. The preparation of this delicacy is a speciality in the valley. A goat is killed and its meat cut into long strips and allowed to dry in the shade. The low temperature of the atmosphere prevents the meat from rotting whilst it dehydrates. Locals claim that meat, when cured in this manner, can keep for a year without any loss of taste, smell or nutritive value.

A small proportion of fodder for the pack animals was carried with them. When halted, the animals were let out to graze on the lower meadows which flank the Chandra River all along the valley. If halted on snow, the mules were driven to the nearest meadow. This might sometimes be over twelve miles away.

## WE ACCLIMATIZE OURSELVES

We left Manali on 24 May and made for our first camp, nine miles away at Rahla, at 9,000 ft. at the base of the Pir Panjal Range. Our usual drill during such moves was for each member to pack up his bedding and assist in striking tents, tying loads, etc. The actual loading of mules was always done by the mule drivers, who had their own methods and preferred no interference.

Mr. Charley and I would usually go ahead to select a suitable Camp site, about eight to ten miles away. Here we would await the arrival of the mules, unload these when they arrived and, assisted by the porters and mule drivers, pitch tents, dig soakage pits, refuse pits, and all the other niceties of a camp. The problem of sanitation and hygiene at high altitudes seems to be somewhat less urgent owing to the absence of flies but must nevertheless be tackled.

The first tent to be erected would be the cookhouse tent and we would soon have hot tea ready for the others as they came in. Our tents were single-fly forty-pounders which were shared between two members.

A single-fly tent is little protection against rain and we were wet on two occasions. However single-fly tents save weight and are a definite protection against cold and wind, if pitched carefully. We were always able to build an effective wind-break with the aid of our packing cases. The ideal would have been a light-weight Alpine two-man tent.

Professor Mani, the three research associates and Dr. Kapur invariably moved from one camp site to the next at a leisurely pace, stopping wherever they liked to collect specimens of fauna and flora. It is surprising how many insects one can catch if one knows where to look for them and how to catch them. The usual places to look for them are under rocks, on meadow grass, bushes or flowers. The normal methods of catching them are to use butterfly nets, hand nets or to pick each one up with a pair of tweezers. Once collected, an insect is killed by shutting it up in a killing bottle. These are later



transferred into appropriate storage bottles.

By the evening, we would all be together at our new camp site. It was usual to spend at least three days at each site. This time was spent carrying out various tasks allotted to each one. Some would be busy collecting various specimens of the fauna from the surrounding peaks for up to a radius of five miles or more. Those who had to do this, would set out early in the morning so as to try and be back in camp by noon. Movement after 11 a.m. is most tedious on deep snow as the surface does not remain firm and the sun's glare is painful. The rest of the day would then be spent sorting out these specimens into various bottles and labelling these.

Some would be out collecting floral specimens and filling these into plant presses. Others would be out scaling a peak in order to expose nuclear plates. We had to take frequent barometric readings in order to ascertain our heights above sea level as the maps of the region are apt to be inaccurate. Mr. Charley would be kept busy analysing the chemical composition of rocks and the current and oxygen content of neighbouring streams. I would usually be given the task of shooting bird specimens for the Zoological Survey of India and would wander about with a shot-gun. My bag would often contain such varied items as the Whistling Thrush and the Chukor. I was once lucky to spot the famed hill pheasant — the Monal. This magnificent pheasant is found in the high forest-clad nullahs of the Himalayas where the forests of Oaks, firs and wild rhododendrons are broken up by patches of meadow or rocky principices. All the specimens that were shot were skinned and cured the same day by one of the research associates, who also served as the expedition's taxidermist.

We had originally intended to halt at Rahla for not more than four days, but this was not to be. The weather took a turn for the worse and there were heavy snowfalls on the Pir Panjal Range. We were only able to move halfway up the Pir Panjal Range to our second camp at 12,000 feet by 30 May. This was a mile away from the source of the Beas River. We halted here for another three days. These halts, apart from enabling

collections to be made, allowed us to acclimatize ourselves. Here again, I was made aware of some of the scientific implications of acclimatization.

Few of us appreciate that if an unacclimatized person were suddenly placed at a height of 24,000 feet, he would lose consciousness within two or three minutes and soon die. A human being can however exist at these heights provided he has had a chance to become gradually acclimatized to these heights. This means training the body so that there is, first of all, a minute increase in the volume of the heart and pulmonary ventilation; next, the adaptation of various organs of the body to enable improved oxygen utilization. All this takes time.

During this period we moved about carrying a small pack and haversack. The total weight carried seldom exceeded 30 lbs. One day whilst collecting at 13,000 feet, on the right bank of the Beas River, Dr. Kapur and I observed the tracks of what appeared to be a large biped. The tracks started off on a steep slope on the opposite bank, a mile away, and were clearly visible from where we were. The footprints traversed virgin snow for about fifty yards and then disappeared and could not be picked up even with the aid of powerful binoculars. We at once thought of the 'snow-man'. We did not investigate these tracks as this would have meant altering our route and timetable, which was already delayed. Attempts to photograph the prints the next day with telephoto equipment were unsuccessful as a fresh fall of snow had obliterated all traces of the footprint. The others were most sceptical when we pointed out the area in which we had seen the prints. Our interest in the snow-man was revived on our return journey, as will be related later.

#### CROSSING THE ROHTANG PASS

The weather cleared by 31 May. We could have crossed the pass the next day on foot but this would have served little purpose as our mules and equipment could not have followed us. We were able to move, with animals, on 3 June and pitched our third camp on the Rohtang Pass itself at 13,800 feet. The weather again deteriorated and we had a heavy snowstorm that evening. The temperature went three degrees below zero. The

next day dawned bright and clear and we were joined by two members of the RAF expedition who spent that night with us.

Apparently the RAF had also been put off by the unexpectedly late snowstorms and had abandoned their original plan to reach Shigri. They now intended to scale unnamed peaks in the Kulti area. The RAF expedition were living on RASC Compo-rations and were a little tired of their tinned food. They gladly exchanged some tinned egg and ham, and sausage roll for some of our halwa and purees. No exchange could have been more mutually welcomed by two parties.

The next three days were spent making collections from the peaks flanking the Rohtang Pass at heights between 15,000 and 16,000 feet. First call in the morning would be given by Professor Mani, who always went to bed with a primus stove and coffee at hand within his tent. He would have the camp awake by 5 a.m. There are several advantages of rising early at high altitudes. As already mentioned the snow surface is hard up to about 11 a.m. but one is apt to get heavily bogged in snow if any movement is made after this time. Then again, strong glare and heavy winds of speeds of over 40 mph may be encountered after noon.

Yet another advantage of moving early, especially in the valley, is that the numerous rivulets and mountain streams are easiest to ford at this time. The smallest of streams will often turn into a muddy raging torrent by the late afternoon, owing to the melting snow or a rain storm on some distant peak.

After lunch, at about 12 noon, we would work in our tents or keep near the camp, depending on the type of day. Afternoon tea was at 4 p.m. and dinner at 6 p.m., just before sundown. Once the sun was down, the temperature dropped most markedly and we would all crawl into our sleeping-bags and either work by petromax or go to sleep. We had a small library with us, made up of books contributed by individual members and so there was no shortage of reading material.

Fresh water is a problem at high altitudes, even though you are surrounded by snow. If you melt the snow by fire, the

quantity of kerosine oil required presents you with yet another problem in transportation. One way out is to keep containers filled with snow exposed to the sun's rays during the day. A solar cooker would no doubt be the answer.

At this time of the year, large flocks of sheep and goats are driven over the pass from Kulu Valley to summer pastures in Chandra Valley. On enquiry, I was told that over two hundred thousand animals move across the pass annually. The animals are sheared in the Spiti Himalayas and the wool then sold there, through agents, to weavers in the Kangra and Kulu Valleys. Apparently the locals prefer that their sheep are sheared in the Spiti Himalayas as they believe that the growth of wool is improved if cut in these regions. They also wish to keep their animals warm whilst crossing the Rohtang Pass and so prefer to shear them only after reaching their destination, by which time the weather would have warmed up.

The movement of these large flocks of over 1,000 animals, also serve the shepherds as a means of transportation and an additional source of income. All the larger animals are loaded with two little woollen sacks, each filled with 20 lbs of grain, sugar, salt or some such item, not available in Spiti.

These shepherds or Gaddis, as they are called, wear a distinctive dress, a white woollen duffle kilt, with a cone shaped hat and a rope girdle. The dress is undoubtedly of Greek origin and these may well be distant cousins of Alexander the Great, who were left behind during his whirlwind conquests of western India.

The Gaddis carry no matches with them but in a small pouch hanging at their waistband they carry a wedge of hard steel with which they strike a piece of flint to cause a spark. For tinder, they use the stalk of the wild *Jerbera* plant which grows in these parts in profusion. It takes them only a few minutes to light a fire with this primitive equipment.

#### INTO CHANDRA VALLEY

We had planned on entering Chandra Valley by the end of May at the latest and were already a week behind time.

Reports from the locals and the RAF made it evident that we would be unable to get mules up to Shigri for at least a fortnight and that would be too late. Reaching the Kanzam Pass was now out of the question.

The Professor and the others were not as disappointed as I was. This again was understandable. Their aim was not any particular peak or final objective. They were happy collecting their quota of fauna and flora from varying heights anywhere in Chandra Valley. My disappointment was softened to some extent by the knowledge that the RAF expedition, although composed of mountaineering experts, had also had to abandon their original plan and confine their attentions to nearby peaks.

The Professor decided to cross the Rohtang Pass and carry on to the east, keeping to the left bank of Chandra River, until we could go no further. With this modified aim in mind, we set off for Camp Four, at Gramphu, opposite Kulti glacier, where the RAF had established their base camp.

The tree line in these regions ends between 10,000 and 12,000 feet. Although the variety and abundance of insects falls off rapidly beyond the limits of tree growth, the zone of permanent snows immediately above this limit is by no means barren of life. On the eternal snow-wastes, at altitudes rarely reached by human beings, live a remarkable variety of insects, which have adapted themselves to sub-zero temperatures, oxygen deficiencies and a scarcity of food.

On crossing the Rohtang Pass one is at once struck by the bare appearance of Chandra Valley. Standing on the summit of Rohtang one looks beyond into a new world. Gone are the dense forests and lovely orchards of Kulu Valley. In their place is an unending vista of snow-capped peaks. It is a desolate world of permanent snow, glaciers, barren rock and moraine. The north bank of the river is completely bare except for grass meadows, the southern bank however has some dwarf birch trees and wild rhododendrons.

The Chandra River, in the Spiti regions, is a dirty grey torrent of ice water and is more than 50 yards wide with a

current of over 15 knots. Although the RAF were operating on the opposite bank, we frequently visited their side by crossing over natural snow-bridges which were then still standing. The nearest artificial crossing was an aerial ropeway 12 miles away at Chhatoru. The PWD have however made plans to open up both the Lahoul and Spiti regions. They are busy improving the existing mule route into a jeep track and are constructing suspension bridges at key points across the Chandra River. The heavy snows in these parts limit the working period and also cause severe damage each year to the little that does get completed.

The next three days were spent collecting specimens from all round the area of Camp Four, on both banks of the Chandra River. On 9 June, as the track to the east was still reported as unfit for pack animals, we were faced with another two days stay at Gramphu. Dr. Kapur and I, with one mule, retraced our steps westwards and after passing through Khoksar, entered the Lahoul Valley and reached Sissu. The next day was spent collecting specimens around Sissu and westwards to Gondla.

There is a marked difference between the Spiti and Lahoul Valleys. The latter is warm, cultivated and forested. There are numerous villages and tea stalls within a few miles of each other and continuous traffic on the mule paths. Khoksar and Sissu are villages by any standards and have PWD Rest Houses and a bazaar of sorts. The Spiti regions are cold and relatively uninhabited. One only comes across wandering shepherds or Bhotia and Tibetan nomads who travel to the plains of India to sell their metal and leather handicrafts, and make their annual purchases before returning to the hills. The various camping grounds at which we halted in the Spiti Valley, are all marked on the map and named, as if these were villages, but are in fact open camping grounds without any huts or permanent habitation. A rest house has recently been constructed on the right bank of the Chandra River at Chhatoru, where a suspension bridge is under construction.

We rejoined the others at Camp Four on 11 June to learn that there was a good chance of our continuing eastwards the

next day. We struck camp early next morning but made very slow progress. The pack animals had a bad day traversing two large avalanches which lay across the left bank in a tumult of boulders, snow and uprooted birch trees. It was late in the day when we set up camp at Dhorni Thach.

After two days at Dhorni Thach, we moved on to Chhatoru, where we established our sixth and last camp. From here we climbed Hamta Gorge and crossed the Chandra River by an aerial ropeway to collect specimens from the Purana Khoksar Glacier. This is the home of the famed Himalayan Ibex and Antelope or Serow. It was unfortunate that we did not come across any herds of these fine animals. The locals told us that the heavy late snows had driven large numbers of these animals down the valley into warmer pastures in the Lahoul region.

On 18 June we struck camp and began our return journey to Manali.

#### THE ABOMINABLE SNOW-MAN

Our return journey was quicker. We did not have to halt at each camp for longer than it took us to climb up and collect the nuclear plates which had been left exposed on various peaks whilst on our way out. The collecting of specimens however continued whenever possible. Attempts were also made to collect insects by night, using a conventional night-light trap. Whereas an exposed light attracts swarms of insects in the plains, it is surprising how few insects are attracted to a night-light at high altitudes. Only one or two would be attracted in an hour.

Although hardly a fortnight had gone by since we had passed this way, the weather had warmed considerably and much of the snows had melted. We now discovered an entirely new world of flowers, moss and lichen. Everywhere around the camp, nature had spread a wonderful carpet of wild flowers of every colour—pink, red, lilac blue, violet and yellow. During the day the sun shone brightly from a deep cobalt-blue sky, without a trace of clouds. The meadows were strewn with thyme, sage and juniper.

It was whilst re-crossing the Rohtang Pass that we learnt that the RAF had observed large tracks in the snow at 12,375 feet and were following up, what they felt, might well be a snow-man. They reported that they found 'tracks of a two-legged, five-toed creature with one-foot-long feet and a weight so great that the footprints sank 11 inches in snow that a Man's foot depressed only one inch.' The RAF expedition took many still and cine photographs of the prints but found that the tracks vanished on a glacial wall and they could find no further traces of the 'snow-man'.

We were very much excited by these reports. Professor Mani's comments on the 'snow-man' were dispassionate. He explained how the imprint of a bear's fore paws were five toed and that a bear normally placed its rear paws over the imprint made by its fore paws. This explained why the footprints were always thought to be those of an outsized biped. The Professor also reminded us that any imprint made on snow that is evaporating tends to expand and would heighten the impression that the footprints were those of a very large animal. He was of the opinion that the snow-man was no other than a Himalayan bear.

We were back in Manali by 21 June. The expedition was pleased at the results achieved. Over 5,000 specimens had been brought back. The insects and other data collected are being studied at Agra and by specialists abroad. The entire collection will eventually go to the Zoological Survey of India.

When I asked Dr. Kapur if he had any reason to believe that we had discovered any new specimens which were unknown to science, he smiled and replied: 'It will take us about three years to study all we have collected and draw any conclusions from what we study. There are no short-cuts in entomology.'



REVIEWS**MERCHANT SHIPPING AND THE DEMANDS OF WAR**

C. B. A. BEHRENS

*H.M.S.O. and Longmans, 35|-*

One of the consequences of the Industrial Revolution of the 18th Century was that Great Britain consciously and deliberately sacrificed her agricultural economy for the sake of her industrial prosperity. This policy was to prove almost fatal to the country during the two world wars which have so far dominated this century. The reason is clear. The country's very existence depended on a regular flow of imports meant for the daily sustenance of the British people. It meant that the trade routes—the 'life lines'—of the British Isles needed to be guarded and kept open for the ebb and flow of this vital traffic. In war, whenever the safety and use of the life lines was threatened either owing to a submarine blockade or to a crisis in shipping or to both, the nation's existence was also threatened. The importance of sea power and of a large mercantile fleet to such a country is therefore easy to accept.

The volume under review is one in the Civil Series of the United Kingdom history of the Second World War. It begins with the immediate pre-war years—the Nineteen Thirties—which were noted for the absence of both co-ordination and planning to meet future emergencies. There was apparently no organisation for use in the event of war; no scheme for the taking over of merchant shipping; no statistics of what was available or required; nor were even these various needs foreseen. The assumption of the Committee of Imperial Defence was that no major war was to be expected for the next ten years—the beginning of this 10 year period had the curious knack of being postponed from year to year.

The nation paid heavily for this. The early months of the war were marked by 'confusion' and 'chaos' in the handling of

ships, ports and inland transport, and their auxiliary services. Ships had to be hastily equipped for defensive purposes, port facilities had to be improved for the rapid handling of a variety of cargoes all at once, convoy systems introduced, suitable quay-side and cartage facilities for the rapid clearance of cargoes either to or from the railways, and a host of other efforts, had to be made not only to help in the quicker turn round of shipping but what is more, to relieve congestion in ports.

The United Kingdom ports which were built to cater to peacetime needs had to switch over almost overnight to a war-time role. A temporary breakdown in the existing arrangements was, in the circumstances, inevitable. After a week of continuous air raids over Liverpool, in May 1941, 'Out of some 130 berths normally available for deep-sea ships, only 12 could be used; the railways serving the docks were mainly out of action because of debris on the lines; the telephone system had completely broken down; passenger transport in the city was in a state of chaos'. Statistics had to be compiled afresh and original plans scrapped and redone.

No history of a war is ever complete without a mention of the human side of it; 'ships and those who serve in them have an interest in their own right. The men who serve in them are human beings and not mere means to ends'. It is therefore refreshing to read in the chapter on 'The Crews' about those who 'with totally inadequate protection and largely lacking even the rudimentary means of self-defence and self-preservation were sailing out and home through submarine infested waters of the Atlantic often with cargoes of steel, that caused their ship to sink like a stone within a few minutes of being hit, when the water poured into the half empty holds'.

The concluding chapters contain certain revealing glimpses of Anglo-American relations and also of the American chiefs of staff on the one hand and the War Shipping Administration—a Civilian authority—on the other. At various conferences and particularly at the Argonaut Conference in January 1945, there were unpleasant scenes, both parties to the shipping dispute having 'arrived at the Conference convinced that a major principle was at stake'.

It was unquestionably the outstanding leadership of Mr. Churchill and President Roosevelt that ultimately helped to lighten the difficulties and smooth over the differences between the civil and the Service chiefs.

Statistics form an important part of the book and are given in 70 appendices. There is a useful glossary of terms at the end. The reader would do well to study this before embarking on the main theme.

D. A. K.

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## THE STORY OF THE INTEGRATION OF THE INDIAN STATES

V. P. MENON

*Orient Longmans, Rs. 25*

India is one geographical entity and yet it cannot be said that throughout her long history she had ever achieved real political homogeneity. At best, the mosaic of the various empires that rose and fell through history comprised a number of autonomous States under the Imperial suzerainty. These empires were held together almost entirely by the personality and might of the emperor. The whole edifice crumbled when a line of 'Supermen' came to an end.

The British, however, managed to achieve much political consolidation during the 150 years of their rule. It was a consolidation based on the principle of paramountcy, and we saw on the eve of Independence, the curious and unparalleled phenomenon of the map of India studded with as many as 562 States, each one of them a centre of feudal autocracy, some of them larger and more populous than many a sovereign member of the United Nations, whilst others were petty estates no bigger than mediaeval manors. All of them came under the supremacy of the Paramount Power whose Political Department was analogous to the 'Supermen' emperors of more ancient history.

And now, on the 15th of August, 1947, the Superman was to abdicate power, relinquish his paramount position. The consequences of the lapse of paramountcy held very dangerous potentialities. Many of the States were without the necessary resources to protect them from internal troubles. The communal situation in British India was grave, a mammoth two-way exodus of population was imposing a calamitous strain on our resources, the armed forces were in the process of partition and, therefore, at the nadir of efficiency. Was our hard-earned freedom to disappear through the States Door? It was an hour of great national crisis. The Man of Destiny that stepped into the breach and stemmed the floods of "anarchy and chaos that threatened to overwhelm great and small in common ruin" was Sardar Vallabhai Patel.

The story of the Integration of the Indian States recounts the genius of this far-sighted statesman, the Sardar as he was affectionately called, who created order out of chaos, and built up the unity of India without which our freedom would have been doomed at its very inception.

It is a remarkable story, told convincingly by one who held an unassailable position of tremendous prestige in the States as well as the Government of India during the vital period when the Integration drama was being enacted. As Secretary of the States Ministry, he enjoyed the fullest confidence of the Sardar and their relationship was very much on the plane of a deep and fine friendship forged by mutual respect and common endeavour.

Mr. V. P. Menon, before he took over the States Ministry, was the Constitutional Adviser to Lord Mountbatten and was thus closely associated with the epoch-making events that preceded partition. As a member of the permanent Services, he had been dealing with Constitutional reforms from as long ago as 1917. The profundity of his knowledge and the continuity of his experience has infused an obvious historic sense into this remarkable book—the most authoritative work that has issued on the subject of the Integration of the States.

**THE MEDITERRANEAN AND MIDDLE EAST—VOL. II**

MAJOR-GENERAL I. S. O. PLAYFAIR AND OTHERS

*H. M. Stationery Office, 35/-*

This second volume of Middle Eastern war history covers the period from March to November 1941, and deals with what can perhaps be described as the most critical period of the war in this theatre. The first half of 1941 held many set-backs for British arms. German aircraft in Sicily brought about a rapid deterioration of the air situation; just as the gradual build-up of Rommel's forces caused the turning of the tables on land. In the war at sea, aerial mining of the Suez Canal caused serious delays in turn-round of ocean shipping; and though the remarkable naval victory off Cape Matapan reduced the dangers of enemy raids in the Eastern Mediterranean, they did not remove all anxieties.

The stripping of the forces in Cyrenaica to provide for the expedition to Greece; the subsequent disasters, both in the Balkans and in the Western Desert; and the loss of Crete, are the subject of the first eight chapters. The revolt in Iraq and the campaign in Syria are dealt with next. At the end, the final campaign in East Africa—culminating in the capture of Gondar on 27th November—completes the list of operations for 1941.

Perhaps the most interesting part of the book is the chapter on 'Changes in High Command'. Here, for the first time, Mr. Churchill's bias against General Wavell has been made public. 'In August 1940 Mr. Churchill met General Wavell for the first time . . . at this early stage Mr. Churchill had doubts about the fitness of General Wavell for his important post.' In an outspoken chapter, we are told not only of this initial lack of confidence which the Prime Minister entertained for his Commander-in-Chief in the Middle East, but also of the unnecessary interference in military matters well within the domain of local commanders. His directions to General Wavell even contained suggestions for altering the dispositions of his forces.

It is not unnatural that General Wavell should have resented such interference, most of which came in the form of

personal telegrams. 'Although they were typical of Mr. Churchill's normal methods, these telegrams contained so many inquiries and suggestions about matters of detail . . . that to General Wavell, who was already conscious of a lack of confidence in himself, they were irritating and, in his opinion, needless.'

The developments leading up to the creation of the post of a resident Minister of State in the Middle East, representing the British War Cabinet, are also described in detail and are of considerable interest.

D. K. P.

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## THE FATAL DECISIONS

### SIX DECISIVE BATTLES OF WORLD WAR II

EDITED BY WILLIAM RICHARDSON AND SEYMOUR FREIDIN

*Michael Joseph, 25/-*

The value of this book lies in the fact that it contains narratives and analyses of the principal battles described from the German point of view by Generals who actually fought them. The separate narratives are linked together by an introduction by Cyril Falls, with a commentary by Lieut.-General Siegfried Westphal who was Chief of Staff to General Rundstedt in the West. For a student of military history, therefore, this book will be listed as a must.

General Werner Kreipe's comments on the air battle against England; General Blumentritt's exposition of the various factors which finally bogged down the German army in Russia, and his belief regarding the inevitability of its defeat against the Red Army; General Bayerlein's recounting of the North African campaign, and the repetition of the same inflexible 'no-retreat' strategy of Hitler; and finally General Zimmerman's 'inside information' regarding the behind-the-scenes conferences which Hitler held with the Field-Marshal and their Chiefs of Staff after the Allied break out from the invasion

beaches; these are the highlights of this excellently edited volume.

Of the Ardennes offensive of December 1944, General Manteuffel states that the main reasons for its failure were: firstly, the Allies' immediate reactions; secondly, the coordination of the Allies' plans; and thirdly, the unlimited air superiority of the Allies when the weather cleared.

Altogether this book is one of the best to have emanated from 'the other side of the hill'.

D. K. P.

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**An Introduction to  
PACK TRANSPORT AND PACK ARTILLERY**

MICHAEL F. PARRINO

*Queensland Publishing Co., \$5.50*

This interesting introduction tells us about the development of pack transport and use of pack artillery in the U.S. Army and removes for ever the impression that was in our minds for a long time that the modern 'machine' Army has no use for such an old trustworthy friend as the mule. Pack transport and the pack artillery are based on the mule and there is no better animal to carry this load on its back. To make the best use of the mule we must understand him and the author has very capably pointed out his characteristics and how to handle him. 'In the matter of discerning and avoiding hidden dangers it is common knowledge that a mule has an intelligence far superior to that of man.'

In our battalion we had a *Makra* mule but he was the strongest and was loaded with the heaviest. He did not like this particularly when a long march was in the offing. He tried all 'Jackassery' to pass the load on to someone else but he was loaded all the same. In the middle of a steep climb his load

began to rattle and when the saddle was taken off he had a sore. The harassed muleteer was marched in front of the transport officer, who accused him of negligence:

'But, Sir, I checked the girths at the last halt.'

'That's a lie. How can a mule loosen his girth?'

'He is cleverer than us. He kept the wind in.'

It is true, the mule is clever, and you cannot learn his tantrums after 15 days of becoming a transport officer. You have to live with him and, as the saying goes, once a mule leader always a mule lover. He is a unique pet, this mule.

It is fascinating to see a mountain (pack) artillery section coming into action. 'It is a poor artillery battery indeed that cannot commence fire within one minute from the time the mules are let into position'. The mules are led at gallop, the heavy pieces are snatched away; banged into each other to form a whole; and the famous 3.7 Howitzer is ready for close support of infantry.

In difficult terrain like we have in India the mountain gun on pack is the most reliable weapon and we are proud of our mountain gunners. Their extreme efficiency depends on the scientific development of the pack loads, the harness, the training of gunners, muleteers and the mules.

Major Parrino, who obviously loves the mule, has done a great service in explaining in a clear and simple way the importance of man management and packing to help the Army mule to carry its load wherever the infantry wants it.

It is a book which should be read not only by Mountain Artillery men but all infantrymen who have always obtained the best and closest support from the 3.7 Howitzer loaded on that

*'... damned old fool of an*

*Army mule who is never known to fail.'*

R. S.



**"THE NAVY'S HERE"**

WILLI FRISCHAUER AND ROBERT JACKSON

*Victor Gollancz, 16/-*

A grey ship with a black funnel aft, carrying the black-and-white flag of the German 'Reich Service', and in bold, two-foot-high letters, the name **ALTMARK**. She could be an innocent tanker, but then. . .

This is the story of a ship whose mission was to survive—to survive not for her sake, but to preserve herself for the Graf Spee. Her store rooms were bursting with supplies—oil, food and ammunition—and she was to act as the indispensable floating supply base to the German Raider, the Pocket Battleship Admiral Graf Spee who in turn would make the high seas dangerous, nay, deadly for the enemy.

As the relentless war at sea progresses, the Altmark's stores of supplies dwindle in replenishing the insatiable Graf Spee. In return she gets regular loads of human cargo—British prisoners from the Merchantmen that fall easy prey to the powerful battleship at large. Masters and mates, apprentices and artisans form the motley crowd that jostle with ordinary seamen, both British and Indian, within the stuffy confines of the hell ship's holds. Six months is a long period, by any standards, to be continually at sea. But it is an eternity if one has to live under conditions that were the miserable lot of the Altmark prisoners. The circumstances of mental duress and physical stress bring out the best and the worst in the individuals concerned and make a very interesting psychological study.

Since this is essentially a story of the Altmark, naturally the adventures of the Graf Spee get but limited attention but the Battle of the River Plate, where she ultimately met her doom, is well portrayed. The poignant last few hours of this once powerful battleship were of absorbing interest to the world of that time and is equally so to the reader of the present.

With the loss of the Graf Spee, the mission of the supply ship was over. The vessel hid in the South Atlantic for nearly

two months and relying on luck and weather, she finally made her dash for home and only after passing between Iceland and the Faroes was she sighted by the British Air Force. The story now mounts to an exciting climax. The rescue of the unhappy prisoners just when they were about to be delivered over to indefinite German bondage was described even by the sedate and prosaic London Times as 'a story of a kind to delight the authors of *Treasure Island* and *Westward Ho!*' And the redoubtable First Lord of the British Admiralty, Mr. Churchill, with ever an eye on history said "To Nelson's immortal signal of one hundred and thirty-five years ago 'England expects that every man will do his duty,' there may now be added last week's no less proud reply: 'The Navy is here!'"

N. K.

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## A HISTORY OF THE ENGLISH-SPEAKING PEOPLES

### VOLUME I—THE BIRTH OF BRITAIN

SIR WINSTON CHURCHILL

*Cassell, 30/-*

Sir Winston Churchill made arrangements for the publication of his *History of the English-Speaking Peoples* nearly twenty years ago. The Second World War and his subsequent preoccupation with his war memoirs delayed the publication of this work. However, the appearance of this first volume, in a series of four, could not have been better timed. It has appeared at a stage when a stirring reminder of their noble history will act as a morale raiser to the people of England. The author's purpose in compiling the *History* is to emphasise the basic unity of the New World and Britain. His object in the first volume might well have been to lift up the spirit of a despairing generation of Britons.

Just as he has held the House of Commons with his stirring war-time speeches, so Sir Winston holds his reader spell-bound from the first chapter to the last. The book does not (as

the author remarks) seek to rival the works of professional historians. It aims rather to present the personal view on the processes whereby English-speaking peoples throughout the world have achieved a distinct position and character. There is nothing new in what Sir Winston has written, but as can be imagined, it reads as though it were new and freshly stirring.

The book begins with the glories of Rōman England, but casts back to earlier unrecorded history. Thereafter the author 'rides as a knight errant' through the successive landmarks of English history in an attempt to set up anew the fame and renown of past Britons. He does not cavil at legend or lore; be there a story which illustrates his point—whether it is of Charlemagne, Arthur or Alfred—he does not allow doubts of authenticity to prevent him from repeating it with relish. Where ascertainable facts are available, he is of course splendid.

Perhaps the best piece of historical recording is contained in his lucid account of the Wars of the Roses. The book takes us up to the Battle of Bosworth Field, and the transfer of Richard's crown. Here the author leaves the reader for the time being, until the appearance of the next volume of this work.

D. K. P.

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## BRITAIN

### AN OFFICIAL HANDBOOK

1956 Edition

CENTRAL OFFICE OF INFORMATION, LONDON

*H. M. Stationery Office, London*

The latest edition of this comprehensive handbook of over 500 pages which we have received contains much valuable information for students and others interested in Britain. It is available for sale at British Information Services, Eastern House, Mansingh Road, New Delhi, at Rs. 5-10 plus Rs. 1-8 postage.

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**THE ITALIAN CAMPAIGN****1943-45**

LIEUT.-COLONEL D. K. PALIT, Vr. C.

*The English Book Depot, Ferozepore Cantt., Rs. 5*

This analytical digest of the Italian Campaign has been written primarily for the benefit of officers preparing for examinations. In a ninety page booklet the author has condensed the whole campaign with comments at various stages, and a final summing up of the lessons to be learnt. It is well illustrated by a number of maps and sketches, and will no doubt be of great value for those whom it is intended as well as students of military history generally.

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## SECRETARY'S NOTES

### Elections to the Council

As a result of the elections to the Council the following twelve members have been elected for 1956-57, names being given in alphabetical order:—

1. Air Commodore Arjan Singh, D.F.C., I.A.F.,
2. Commander J. Chatterji, I.N.,
3. Lieut.-General J. N. Chaudhuri, O.B.E.,
4. Commander V. A. Kamath, I.N.,
5. Captain N. Krishnan, D.S.C., I.N.,
6. Air Commodore P. C. Lal, D.F.C., I.A.F.,
7. Brigadier C. R. Mangat-Rai,
8. Lieut.-Colonel D. K. Palit, Vr.C.,
9. Brigadier Rajinder Singh Paintal,
10. Shri M. V. Rajwade, I.A.S.,
11. Brigadier Apji Randhir Singh,
12. Major-General S. D. Verma.

### Subscriptions

Subscriptions are payable in advance. Members who join in the last quarter of the year, but do not require the journals for 1956, can have their annual subscription reckoned with effect from January 1957.

### Library

Suggestions from members are welcomed for the purchase of new books for the Library. The choice is necessarily restricted to books of special or of general interest from the defence point of view.

Copies of the Library Catalogue can be had for Rs. 6/- plus postage.

### Essay Entries

Entries with the following mottos were received for the Gold Medal Essay Competition for 1956:—

1. "The True Reward of Armies is the good opinion of their Fellow Citizens," 2. "The Will to Do, the Soul to Dare," 3. "Down to Earth," 4. "Excelsior," 5. "Unity Through Diversity."

The result will be announced in the October-December issue of the Journal.

### Change of Address

To enable the address list to be kept up to date members are requested to notify the Secretary's office of any change of address on promotion or transfer. Where applicable I.C. numbers may also be given. Please make use of the printed form given elsewhere in this issue.

### New Members

From 1st May to 30th September 1956 the following members joined the Institution:—

AUTAR SINGH GILL, Captain, The Assam Regiment.

\*BHARGAVA, Lieut. M.S., E.M.E.

BHATT, Lieut.-Colonel B.J., J.A.G.'s Department.

CHATURVEDI, Sub.-Lieut. C.M., I.N.

D'SOUZA, Instructor Lieut-Commander CHARLES, I.N.

DHINDSA, Captain J.S.

GANESH, Lieut.-Colonel T.K., E.M.E.

GANESH, Lieut. V., Engineers.

GOEL, Sub.-Lieut. M.C., I.N.

GREWAL, Major T.S., The Guards.

JOGINDER SINGH, Captain B., The Jat Regiment.

KHANNA, Captain V.K., The Guards.

KOHLI, Major R.D., Artillery.

MISRA, Colonel R.K., M.B.B.S., F.R.C.P., I.M.S. (Retired).

PRATAP, Lieut. Y., Signals.

PREM SINGH, Captain.

RAMAN, 2|Lieut. P.M., 3 Sikh Light Infantry.

RANJIT SINGH HERR, Captain.

RASTOGI, Captain S.C., Engineers.

ROY, Sub.-Lieut. N.K., I.N.,

SANYAL, Major M.C., A.M.C.

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\*Life Member.

SHAHANE, Sub.-Lieut. V.M., I.N.

SHARMA, Captain S.C., The Dogra Regiment.

### SUBSCRIBING MEMBERS

Eleven Officers' Messes and Units were enrolled as subscribing members during the period.

### CHANGE OF ADDRESS

To,

Date.....

Secretary,  
United Service Institution of India,  
Kashmir House, New Delhi.

Please note my new address.

Name (in block caps).....

Rank and unit.....

Permanent address.....

Present address.....

Signature.....

# The Journal of the United Service Institution of India

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*The views expressed in this Journal are in no sense official, and the opinions of contributors in their published articles are not necessarily those of the Council of the Institution*

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## EDITORIAL NOTES

### International Police Force

It is an ill wind that blows nobody any good. Happenings in the Middle East during this quarter of the year have focussed world attention as never before on the need for international co-operation in finding a just solution to the disputes which have plagued this area in the post-war years. The temporary closure of the Suez Canal has only helped to underline its importance as an economic life-line between Europe and India and regions farther east. To keep it open and functioning efficiently and impartially in the best interests of the parties affected—the user nations as well as Egypt in whose territory it lies—is the issue which now faces the U.N. The quick action taken by this body in calling a halt to hostilities was successful largely because of the provision of an international police force to ensure a rapid return to peaceful conditions. This organization of an international police force is a significant development in the



evolution of the U.N. and may well turn out to be a landmark in human history.

### **Services Delegation to China**

The Defence Services delegation which returned to India in November after a five-week goodwill visit to China was able to visit several defence as well as industrial and cultural establishments in the far-flung provinces of China. The progress of heavy industries in Manchuria has given China the necessary industrial backing to her considerable defence potential in man-power. Even during the Japanese occupation the rich mineral resources of the North had begun to be exploited. With an abundance of coal and iron—the basic requirements in heavy industry—and the new enthusiasm and urge of the people all over the country, the pace of industrialisation, as can well be imagined, has been greatly accelerated. With centuries old traditions of culture and good living, and the new awareness of the outside world, China is in the process of opening doors to greater international understanding. The Indian delegation from all accounts was greatly impressed.

### **This Age**

The search of our ancestors for the elixir of life and the philosophers' stone may perhaps be translated into modern equivalents in terms of the jet age and the nuclear age. Nuclear research holds out promising prospects of a world blessed abundantly with all the good things of life. But will life itself be lengthened and human beings live younger longer? Modern preventive medicine has certainly reduced mortality rates in large areas of the world, but the life-span of the citizen even in the best regulated communities with the highest average for longevity remains the Biblical three score years and ten. A good proportion of men and women who have achieved world eminence are in

their prime in their sixties. Much as the world can ill-afford to lose them, nature has to keep a certain balance between the birth and death rates to prevent the world becoming over populated. But science is making it increasingly within the reach of mankind to live a fuller and richer life within its allotted span. With the jet age of quicker communications and travel weeks are compressed into days and days into hours.

### **Greetings and Farewell**

Although by the time the Journal reaches the hands of some of our readers January may be well advanced, the Editor wishes to take this opportunity to wish a happy New Year to all members, subscribers and other readers. This is also in the nature of a leave-taking, because after this issue there will be a change in the editorship. The present editor has been on this assignment for eight years, during which period the Institution and the Journal have been gradually emerging from the uncertainties of the post-war and post-partition years. Thanks to the goodwill and co-operation of many friends and well-wishers the USI has now completed the eighty-sixth year of its existence, a record of which any Journal might be proud!

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*Two copies are required of all articles sent to the Editor. These should be typewritten with double-spacing, and on one side of the paper. Articles not accepted will be returned only if accompanied by a stamped self-addressed envelope.*

## PEACE-MAKING AND WAR-MAKING IN THE TWENTIETH CENTURY

K. M. PANIKKAR

Lecture on Monday, 29th October, 1956

[With Major-General M. S. Wadalia in the Chair]

THE CHAIRMAN: It is my privilege this morning to introduce Sardar Panikkar to you, not that he requires any introduction to a body such as ours. His reputation as a scholar and a historian is already worldwide. As you know, he has written some brilliant books which students of military affairs will find of considerable interest. I have in mind particularly his "Future of India and South East India" and "Asia and Western Dominance". Up to quite recently the more distinguished of our literary men had not evinced an interest in affairs military with the result that the reading public, by and large, has remained ignorant of the factors that bear on the problem of National Security. We are fortunate in having a man of Sardar Panikkar's calibre in our midst. This morning he has chosen the subject of "Peace-making and War-making in the Twentieth Century" to address us on.

### LECTURE

THE transformation of war into a total and all-embracing activity of the nation is one of the important developments of the twentieth century. Though total war was invented by the French National Assembly in 1793, it was then conceived as a defensive measure. Barere in proclaiming the doctrine in the Assembly declared as follows:

"From this moment until that in which every enemy shall have been driven out of the territories of the Republic, every Frenchman is permanently under requisition for service with the armies. Young men will go out and fight; the married men will manufacture weapons and transport stores; the women will

make tents and clothing and nurse in hospitals; the children will scrape lint from old linen; the aged will take themselves to the public squares there to raise the courage of the warriors and preach hatred against kings." This is total defence and not total war as the 20th century came to know it.

The wars of the 19th century were essentially limited wars and the nations were not engaged to carry it to a conclusion with total national effort. After the crushing defeat at Jena in 1805, the Commandant of Berlin announced merely: "His Majesty's troops have lost a battle. Calmness is the first duty of the citizen".\* The Crimean war had a strictly limited objective; and the two major wars that changed the political balance of power in Europe—the Austro-Prussian War of 1864, and the Franco-German War of 1870 were also wars by professional armies. At the beginning of the 20th century the Boer War, which was no more than a colonial adventure, divided the nation in England and a considerable section was frankly pro Boer. Even the much more significant conflict between Russia and Japan was limited in operation as it was in purpose.

Modern warfare where the totality of national power is engaged on both sides, against civil power no less than the armed forces, against the industrial and economic organisation of the enemies, no less than against their cities, towns and harbours is a development of the 20th century, which showed itself in its true form in the war of 1914-18. It is not merely the changed character of weapons—the aeroplanes, the submarines, etc.—that brought about the change. Primarily, it is the changed character of the state itself. The state in the twentieth century became the repository of total power claiming for itself the power of all its citizens to the furtherance of its own purposes. The state where it was not itself the organiser of economic life was closely allied to all the sources of economic power—industry, finance and commerce. The wars of democracies and of totalitarian states have therefore to be total in character and have to be fought for total victory. It was the ignorance of this fact

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\*Quoted in Erich Meissner's *Confusion of Faces*, London, 1946, P. 46.

that led to the collapse of Germany in the first war. The German Empire, a survival of the old monarchical system, still believed that wars could be concluded by a negotiated peace. Once the first onslaught of the German armies failed, the imperial government kept on trying to bring about a satisfactory peace by negotiation. But as soon as the democracies were engaged on a total effort, the idea of negotiation became repugnant to such an extent that the leader of the Conservative Party in the House of Lords, and a former Foreign Secretary, Lord Lansdowne, found it difficult even to get a letter published in favour of a negotiated peace. It was the theory of 'the knock-out blow' that found favour with the democracies in the first war as it was the slogan of unconditional surrender in the second war. Complete victory or utter defeat are the only alternatives in a total war.

What are the characteristics of this changed system of warfare? Primarily warfare is no longer conceived as a fight between armies, but as a fight between nations. This means that every aspect of a nation's life is a legitimate target of attack and destruction; in fact the logical conclusion is that the nation itself could be destroyed if that were within the range of possibility. Nothing is sacred or safe and women and children no less than the old and disabled suffer from air attacks and from guided missiles. Food production, irrigation facilities, and civilian transport are equally subject to attack and destruction. Nor are churches and sacred precincts safe from enemy action. During the first world war when the Cathedral at Rheims suffered as a result of German bombardment, the moral conscience of the world was shocked. But in the second war, when the monastery of Monte Cassino was destroyed and the Cathedral at Cologne suffered from air attack—not to speak of innumerable other churches razed to the ground on both sides—the world accepted it as something which was unpleasant but had to be accepted as a part of the total war. The climax of this destructive activity was of course the attacks on Hiroshima and Nagasaki by atomic bombs.

Thus it is the total organisation of the resources of the people and their utilisation by the state that creates the total

war and not the character of the weapons. But the character of the weapons has undoubtedly changed the technical aspects of war and extended the total character of offence and defence. The destruction of enemies' life and strength behind the lines was made possible by the conquest of air. Similarly, the development of under water craft has extended the range of warfare far beyond the conception of the 19th century. The guided missiles which made their appearance in the second world war, and finally the atomic bomb, have fundamentally altered the character of armed conflicts.

But basically what changed the techniques of warfare was the invention of the internal combustion engine. Practically every aspect of military organisation has been changed by it. One immediate result of this change has been the dependence of military power on industrial capacity. One major aspect of the 20th century development in this respect has been that only the most advanced nations in the field of industrial organisation are today able to carry on large scale warfare. To take only one example—steel has become the major material for most things connected with war and steel in quantities necessary for modern warfare could only be produced by highly industrialised nations. Again fuel without which the internal combustion engine cannot operate can only be extracted by nations who have reached a very high level of technology, and nations who have no access to natural oil have to depend equally on advanced scientific and industrial skills for the production of synthetic fuel.

The industrial basis of warfare has become much more obvious with the ushering in of nuclear weapons. The production of internal combustion engines was itself limited to a few states, who by their technical skill, industrial resources and in most cases their internal markets were able to build up and sustain so complicated and extensive an industry. In the same way the fuel resources necessary for war were also controlled by states with advanced technical knowledge and financial resources. The position in regard to nuclear power is that only the three most advanced nations, U.S.A., U.S.S.R., and U.K. have been able successfully to develop nuclear resources for the purposes of war. Warfare in its most destructive and conclusive form has thus been reduced to the monopoly of the great powers.

Another significant influence of twentieth century science in warfare is the ability to coordinate and control the movement of large masses of men and immense concentrations of mechanical power like naval and air fleets from headquarters. Napoleon is said to have declared that no general can successfully fight a battle unless he can see every part of the battle-field and take his tactical decisions on the spot as the battle develops. In the conditions of Napoleon's time it would have been impossible for any commander to deploy in battle the immense armies of today. What has made it possible for commanders to control battle lines extending over 1,500 miles as in the second great war in Russia, or hundreds of miles as in Western Europe is the scientific advance which has placed at the disposal of commanders telephones, wireless communications, radar facilities, and aeroplane reconnaissance. The Commanders' eyes can now extend over thousands of miles and what is happening at any section of the battle front can be known immediately at headquarters. Consequently battles are no longer confined to fields, Blenheims, Austerlitz and Waterloos but over immense areas sometimes not connected with each other but working according to a single strategy. Twentieth century warfare therefore tends to be spread over large areas, as the range and reach of scientific controls become more and more extensive.

The unlimited character of expenditure is also a feature of warfare in the 20th century. Warfare today is no cheap game, but involves the entire financial resources of a state. To what an extraordinary extent war expenditure has grown may be seen from the following. In the appendix to his political testament, Frederick the Great who in his time may be said to have mastered all the intricacies of war told his successors that Prussia should have enough resources to yield a surplus revenue of 5 million Thalers. According to him, a campaign would cost roughly 5 million Thalers and if this amount of surplus revenue could be provided then there need be no financial worry in case a war is decided on. The amount which Frederick the Great calculated as the expenses for a campaign would not be sufficient for a day's warfare even on a limited scale today. In the 19th century expenses undoubtedly had gone up but compared to the cost of wars in the 20th century this could be considered negli-

igible. The unaided recovery of France after a quarter of a century of revolutionary warfare which ended with the treaty of Vienna, and the comparative ease with which the same power paid off the indemnity imposed on her and built up a stable economy after her defeat in the Franco-German war can be profitably compared with the near bankruptcy in which she was left after the victory in the first Great War. It was only after a heroic effort that victorious France was able to stabilise her currency. England, the strongest financial power in the 19th century, who was able to carry on a quarter of a century of war with France and come out financially stronger at the end of it was forced after four years of war in the 20th century not only to yield her primacy in financial matters to America, but to repudiate her war debt and go off the gold standard. In fact the financial effect of the first World War was so crippling that European domination of Eastern countries may be said to have practically collapsed as a consequence of it. Victorious powers no less than defeated ones felt the far-reaching consequences of the financial burden of the first Great War.

The second Great War only emphasised the same lessons. Apart from the ruin of German and Italian economy, the victorious Western Allies faced a complete financial collapse after 1945. It was only the heroic effort of the United States through the Marshall Aid Plan that salvaged the economies of the European nations. Even then England had to liquidate her total foreign assets, and to withdraw from many of her export markets, and also accumulate debts (Sterling Balances) to the nations whose economies she controlled. Even then she was forced to devalue her currency.

Perhaps even more significant than the financial and economic losses is the loss in man-power which 20th century warfare involves. The first Great War is said to have cost the nations of Europe no less than 20 million men, killed and disabled. The losses in the second Great War in the Soviet Union alone are computed at 20 million. If the losses of all the European nations engaged in war are calculated (including those who lost their lives in concentration camps) it would amount to over 40 million. The problem of the 'lost generation' in England, France and Germany was a notable fact in the inter-war period.



One aspect of 20th century warfare, which deserves to be emphasised is the planned and organised creation of hatred between nations. The techniques and machinery for the control of opinion have become so powerful that every country engaged in war devotes the greatest attention to the manipulation of opinion both at home and abroad and to the extent possible in enemy countries. The enemy has to be shown up as an enemy of humanity, as wicked, degraded, and immoral, as being engaged in a conspiracy against civilisation, while we ourselves are fighting in the cause of humanity, to safeguard civilisation, and to end war. The war to end war, the war to save democracy, the war to save religion and morality, the war to ensure justice and right—these become the declared objectives of combatants. Consequently the enemy has to be painted in the most lurid colours, as monsters unfit to be accepted in civilised society.

In the wars of the earlier period, the division of humanity into sheep and goats, into good and bad was never attempted seriously. It would appear to be a special feature of the twentieth century. In the war of 1914-18 public opinion in England would not tolerate the playing of music by German composers; men of the utmost distinction like Lord Haldane were hounded out of public life for an alleged partiality for German philosophy. Even the British Royal Family thought it wise to discard the historic name of Guelph and substitute for it the patriotic place-name of Windsor! Everything German, including scholarship and literature was run down. On the German side propaganda of this kind was carried on with even greater virulence during the second World War. All except the Nordic races were degenerate and unfit to be called civilised. The Jews, the Poles, the Ukrainians and others were sub-human who should be forced to yield their countries as *liebensraum* for the Germans. Hitler was convinced that he was selected by Providence to be the liberator of humanity from the domination of the lower races. Thus he is recorded by Dr. Rauchning:

'Providence has ordained that I should be the greatest liberator of humanity. I am freeing men from the restraints of an intelligence that has taken charge; from the dirty and degrading self-mortifica-

tion of a chimera called conscience and morality and the demands of a freedom and personal independence which only a very few can bear.'

Equally 'inspired teachers of humanity' on the other side considered themselves as agents of historical forces (or Providence) for the liberation of mankind.

War having thus been elevated to a struggle between light and darkness as a Jihad between the Faithful and the Unbelievers, compromise becomes difficult from the beginning—unconditional surrender, knock-out blow and dictated peace become unavoidable. Another natural result of this is the tendency of the victors to consider the vanquished as moral delinquents, as victory is equated with the affirmation of right and defeat not only with wrong and injustice but with moral turpitude. The war crimes trials which followed the second Great War is essentially a 20th century phenomenon. At the end of the first Great War, the demand for the trial of the Kaiser and of others alleged to be responsible for war crimes was widely voiced but failed to secure international support as 19th century views still survived; but after the second war it became a part of the victors' 'international law' to bring to 'trial' before a court constituted of enemies, not only generals, but diplomats, statesmen and others who had supported the national policy of their governments. Reconciliation between nations after war has thus been rendered even more difficult than at any time before.

Another major change in the lives of nations brought about by war is the greatly depreciated value attached to the study of humanities in the educational system of the major countries. As the widest possible prevalence of scientific skills and technological efficiency has become the basis of a nation's strength, what every state which thinks in terms of competitive power emphasises is the study of sciences, much to the detriment of humanities. This change in values is noticeable everywhere, in old established universities as much as the new centres of learning. Whether this increasing dehumanisation of education in favour of providing technical skills is something which will ultimately benefit humanity cannot yet be determined; but it is an undoubted fact. The only universities today that

do not go in for scientific studies are the Al Azhar and the Lateran universities both maintained primarily as centres of theological training.

The effect of modern warfare though on the whole destructive has, it must be recognised, helped in undoubted advancement in several fields. It is the necessities of the last two great wars that led nations to develop many new materials which are now in general use. Every nation engaged in war has contributed to the discovery and development of substitute materials where the natural product was not available or in short supply: synthetic oil, artificial rubber, etc., are examples. Equally many of the old materials have been put to new uses, and others whose value had not been known have become important for purposes of production. Undeveloped areas have been scoured for resources and the wealth of the world has thereby been increased greatly. An example is the development of tin in the African colonies when the supplies from Malaya fell under Japanese control.

More than all, the scientific advances which the pressure of the world war produced though their immediate purpose was destruction have been of revolutionary significance. Advances in electronics, the splitting of the atom and the possibility of nuclear power for the world are but two of the most revolutionary instances.

Equally important has been the advance in medicine and control of diseases. Penicillin and the sulpha drugs represent the most notable achievements in positive medicine; but they are by no means isolated instances. In surgery, in preventive medicine and in safeguarding conditions of health in varying climates notable advances were made as a result of the requirements of war time.

The oecumenical character of war in the 20th century has had one strange and remarkable result. In the wars of the earlier centuries the objectives were always limited, the defeat of an enemy, the annexation of a part or even whole of his territory and in exceptional cases the destruction of people (Carthage for example). But with 20th century wars, wars to end

war, wars to make democracy safe, wars to safeguard civilisation, all originating as slogans soon became transmuted into a vague idealism for rearranging the affairs of the world. Expectations were roused among the people to enable the total war to be carried on. The enemy who has been painted as the embodiment of evil has at least to be reformed and re-educated, since he cannot be wholly wiped out. So the object of peace making after the wars in the 20th century, was not as in previous eras to patch up the quarrels and to ensure the continuation so far as possible of the system which had been shaken by war, but to reconstitute the world itself in the image of the victors. The two principles came into conflict at the end of the first war. The victorious allies refused to negotiate with the Germans. They were merely handed a document to sign. But the Allies themselves were deeply in conflict. The representatives of the new forces desired to reconstitute the world on the principle of self-determination of nations, of non-annexation, etc., while the representatives of the *ancien regime*, Clemenceau, Lloyd George, Orlando, the Japanese delegates and others were more concerned with gaining their national ambitions. To Clemenceau it was more important that the security of France should be safeguarded against thirty million superfluous Germans. To Orlando, Fiume and Trieste were more important than the creation of a new world, and Britain was more concerned with ensuring that German naval power was not allowed to revive, and that she should succeed to Germany's African colonies. But the public in most countries, influenced by the false idealism created by the war was determined on creating a new world. The political structure of Central Europe was reconstituted to suit the new doctrine of self-determination. The Turk was ordered out of Europe bag and baggage, which, however, he obstinately refused to do. Colonies were camouflaged under mandates. In fact the treaty structure which followed the first war was an uneasy compromise between the new ideas of reconstituting the world and the old policy of aggrandising national interests.

In the second war the position became even more difficult. An unconditional surrender of Germany was insisted upon and secured at heavy cost. But it has not been found possible to negotiate a peace treaty. The Allies had emphasised the evil

character of the enemy that they were forced to make an effort to make the Germans and Japanese good by recreating them in the image of the victors. But as the victorious Allies had two different and conflicting ideas about what was good, the re-education of the defeated was along opposite lines. While Japan was to be made to see the evil ways of her 'oriental system', and accept the model of America, Germany had the misfortune to be the laboratory of re-education experiments in both forms of victorious ideology—the Western democratic and the communist systems. In the division of the world that followed, Poland, Czechoslovakia, Hungary, Roumania and Bulgaria were re-educated and modelled on Soviet ideas and Greece, Italy, Libya on the ideas of the West. As in the case of Germany, Korea, where the two ideologies came face to face had to accept dismemberment as neither of the two great victors was prepared to allow the country to be recreated in the image of the other.

Twentieth century has in fact clearly proved that the conditions under which it conducts its warfare render it impossible to conclude a satisfactory peace. The nature of war makes it a matter of principle on which compromise is impossible. This has been demonstrated again in the two minor wars of Korea and Indo-China. After a bloody conflict which practically laid waste the whole of Korea all that the combatants could secure was an armistice leaving the country divided as before the war and without a settlement of any issue. In Viet Nam also, no peace could be brought about in spite of the withdrawal of France, as two ideologies faced each other across a divided country. It is the combination of carefully worked up hatreds, with moral indignation, which are the inevitable concomitants of modern warfare that renders peace making after 20th century wars an impossible task.

## DISCUSSION

CAPTAIN N. KRISHNAN, IN: Sir, you stated that the totalitarian nature of modern war reduces the issue ultimately to one of national survival which can be further resolved to a question of personal survival. Self-preservation is a most elementary human instinct and I suggest the fear of complete annihilation

makes the very totalitarian nature of modern warfare the best guarantee for the world to keep the peace.

THE LECTURER: The desire for personal survival and of national survival may operate to prevent total war, but it should be remembered that fighting nations and states also survive the war. No doubt the winning state becomes the master of the entire organisation of the defeated nation and therefore the state organisation may suffer. The losses of nations may be immense but in the past there has been no case of a nation wholly disappearing. The problem is not of the survival of the people, but of the state. The State is the Golden Calf into which everything of the people flows and it claims to represent every aspect of human life. The identification of the state with the people is what creates the illusion that survival of that particular form of state is the survival of your identity. The tremendous sacrifices enforced on European nations in their effort to destroy the German nation did not bear fruit as the German nation was not destroyed, in that the German does not appear to have lost his individuality or anything he inherited for the last so many centuries. Only the Nazi State was destroyed. Defeat in a total war is the destruction of state in that particular form and not that of the people. In no war has the entire population been destroyed.

MAJOR-GENERAL B. M. RAO: With the advent of the concept of total war what, in your opinion, will be the future of international conventions relating to war which were all drawn up during the 19th century?

THE LECTURER: The 19th Century was a fair-weather period, a period of optimism. In the 20th century how is it possible to adhere to any of the conventions for the 'civilised' conduct of war? These things have become impossible in the face of modern scientific developments. New conventions have therefore to be developed.

COMMODORE A. CHAKRAVERTI, IN: In the 20th century also we have a convention that we should save old monuments.

THE LECTURER: How is it possible in modern warfare? How can an Air Force bomber avoid hitting a church, mosque or tem-

ple situated in the vicinity of an air-target? Then there can be miscalculations in the dropping of bombs which might hit historic monuments, churches, etc. You cannot blame the Air Force for that. The issue today is not of direct calculated destruction of temples, churches, etc., as might have been the case in the days of Timur. Today the destruction is on such a large scale that one cannot avoid any particular monument, howsoever sacred or precious. What can be done, however, is that all the sacred relics and treasures from such monuments and sacred places should be removed to a neutral zone for safety and kept there for the duration of war. There is no other alternative.

GROUP CAPTAIN RANJAN DUTT, IAF: You have suggested that total war was a result of the democratisation of society. It is also possible that total war has come about as a result of the mechanisation of warfare when the total industrial capacity of a nation has to be geared to the modern mechanised form of warfare. Even before the democratisation of society took place Clausewitz had propounded the theory of total war by stating that war was a continuation of national policy. I would therefore suggest, sir, that if a national policy in war is total then the war itself becomes total. Moreover, as victory today can only be Pyrrhic, I feel wars in future will tend to be limited because nations will be forced to adopt limited political objectives.

THE LECTURER: Clausewitz's dictum that war is a continuation of *policy* is the clearest definition of a limited war. Policy is for the achievement of definite objects and when diplomacy fails to secure those objects, you translate your action into another sphere—that of war, but for the sake of achieving that policy. The nature of total war is also changing every day and, therefore, it is very seldom that any small country will ordinarily embark on total war. Total war has become the monopoly of a few big nations. For instance if India desired to enter total war her capacity would depend on the number of aeroplanes, tanks, etc., she could produce. Our capacity to conduct a total war is limited. But, when you talk of limited objectives, I have some difference of opinion. For example, in Korea, the objective was limited, but the moral indignation of the people had to be created to keep that war going and it became very

difficult to make peace because both sides declared that their objectives were of world importance. In Indo China everybody tried to make it a limited affair but it affected the whole world. If war took place between USSR and USA that will mean total destruction of either.

MAJOR-GENERAL S. D. VERMA: Your very able analysis of the last century on war-making and peace-making seems to have brought out one thing, that is, whilst there were many wars in the 19th century, they were not total wars because only certain people were interested in them. So, peace-making was easier. By and large, we all want peace and the most peace-loving people are service people. If democracy and the working of democracy are the things which lead to the new conception of total war, then there is something wrong with the democratic system. Would you care to let us have your views on this?

THE LECTURER: Democracy itself has changed its functions now. Democracies of the 19th century functioned quite differently. Now, it is the function of a democratic government to carry out the wishes of the people. Whether Parliamentary democracy or any other form of democracy, it claims that power is vested in it by the people with its right to mobilise the capacity of each individual. This is a development of the 20th century. How it has come about and why it has come about is another matter. This particular brand of democracy is an 'omnipotent being', like a Hindu god of many faces, many arms and many instruments of power. Our conception of the state during the last 50 years has really changed in a manner which requires careful consideration by all. It appears it has nothing to do with democracy as such, but it is a particular development of our present-day version of democracy, where people claim to govern directly. Hence mass opinion is important. The enemy has to be painted as so wicked that sanctions must be applied against him—he is beyond all redemption. This conception is a new one. No doubt present-day democracies have other tremendous advantages over past forms; for example they protect national interests in a much more reasonable and logical manner, but once this hatred is preached against enemies, there is no possibility of democracy being able to check it.



LIEUT.-COLONEL R. S. NORONHA: Sir, you said that the state is all powerful and not any one group or individual in the state. This being so how do you reconcile the recent developments in Russia particularly having regard to the fact that these developments are said to be intended for preserving world peace?

THE LECTURER: I know so little about Russia. I would, as an outside observer, feel it wrong that leadership should go to any one person or group. Totality of power and dictatorship are two different things. I don't think there is any state which has claimed such totality of power as England, but no individual or group has in that country ever become 'all powerful'. The power of state is used by legally constituted organisations and not by an individual. What happened in Russia, I am not in a position to say.

LIEUT.-COLONEL R. S. NORONHA: In the modern world then the conception of democracy appears to be a bit different.

THE LECTURER: I was merely saying no country or legislature had been vested with more power than the English Parliament has claimed from the time of Cromwell. The claim of British Parliament for the totality of power was there, but the totality did not lead to concentration of power in one's hand. Such concentration of power would lead to dictatorship.

THE CHAIRMAN: Sardar Panikkar dealt brilliantly with this important question of "working up the soul of the Nation" so as to condition it for war.

Let us cast our own minds back in regard to our own war effort during the last World War. Were we ourselves convinced that the ordinary soldier had a clear conception in regard to the aim of the War? If he were asked why and what he was fighting for, often as not, he would say that he was ordered to and he was carrying out the order. In future, the totality of war and the efforts that go in making a war 'total' — together with the thousand-fold increase in the horrors of the war — will change that conception. More than ever before there will have to be a clear-cut conception in the minds of our people, whether they are in the front line or otherwise, that the cause for which the nation has taken up arms is a just and righteous cause. In other

words, the soul of the Nation must be stirred in a more positive manner.

As has been pointed out by my colleagues, the DCNS and the MGO, we Servicemen are only concerned with the waging of war. We are not concerned with advocating war or instigating it. There was a time when powerful military leaders could take their nations to war. It was then the practice for a grateful nation to reward eminent military leaders for victories by giving them palaces to live in and the means to maintain them. Monetary awards ran into hundreds of thousands of pounds. Under those conditions there might have been some excuse for military leaders to urge nations to war. Today there are no such prizes. On the other hand a vanquished leader, more often than not, will face the charge of war crimes and might even end up by being strung up. It is best therefore to guard against defeat and avoid an ignominious fate.

You will not wish me to detain you any longer and I know everyone present in this room will join with me in thanking Sardar Panikkar for his illuminating talk undertaken at a time when he is particularly busy preparing for his departure to France. On your behalf I would like to wish him the very best of luck and success in his mission. Thank you very much. (Applause).

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## MONTE CASSINO — 30TH SEPTEMBER 1956

COLONEL N. D. NANAVATI, M.C.

**30TH** SEPTEMBER 1956 was a bright cloudless day under a truly Italian sky. At Cassino the sun shone down almost mercilessly on the impressive ceremony taking place at the foot of Monte Cassino. Precisely at 12 O'clock Field Marshal The Right Honourable Earl Alexander of Tunis arrived to carry out the ceremonial unveiling of the Commonwealth cemetery.

Looking upon this peaceful scene brought to mind vividly the stark contrast with what it was 12 years ago. The cemetery is situated between Monte Cassino and the river on a pleasant grass-covered plot of some four or five acres; it was the scene of some of the fiercest fighting in the Italian campaign, constantly under a smoke screen for all the hours of daylight; a network of trenches and shell holes. One almost listened for, and half expected the flashes and reports of guns and mortars, the whine of shells, intermingled with the rhythmic beat of the machine-guns. The dust and the noise of war. Then with a lightening of the heart one realised that all that was over. Now there was a serenity which one could almost feel as if a magic wand had been passed over it turning the clamour and filth of war into peace and green pastures. Looking up one expected to see the black ruins of the Abbey but instead a new Abbey — an exact replica — looked down upon the scene, less grim, but unchanging, serene and timeless.

The village also has been rebuilt and where once there was just a heap of rubble and shell holes now stands a new village, dotted about with cafes and restaurants doing good business with tourists.

On this day however there was an air of solemnity over the whole scene as relations of the dead and many who had been there gathered to pay homage to the fallen.

A short flight of steps leads from the road to the cemetery. Nearest the road is the tomb of an unknown soldier; opposite, beyond some 20 yards of green lawn lies the cemetery. In the centre is a sunken garden with a pool in the middle, on either side of which are two rows of six marble columns, about fifteen feet high, inscribed with the names of those whose bodies were never found but who died in the fighting.

All the famous Indian and Pakistani Regiments which fought in Italy are represented in the names of their men who died in battle. The Punjabis, the Marathas, the Frontier Force Rifles and Regiment, and the Gorkhas, to name only a few, but perhaps the largest toll was taken from the 5th Marathas; names of their dead covered almost a complete column. On three sides around this sunken pool are the graves neatly arranged in blocks for each nation — graves of soldiers from all the Commonwealth.

Field Marshal Alexander was received by a General Salute from the Guard of Honour drawn up in front of the central garden. British and Italian soldiers formed a double guard and having inspected them he moved on to the service representatives of the Commonwealth, also drawn up in line.

A short but moving address was given by Earl Alexander in which he reminded us of the gallantry of these men who had laid down their lives for the cause of freedom and peace in the world.

The Field Marshal who himself had directed much of the fighting in Italy then unveiled the cemetery and, to the roll of drums, flags of the Commonwealth countries covering the marble columns were dropped in succession. The sad notes of the Last Post echoed amongst the hills for the soldiers who lay in eternal sleep. A short prayer by the Chaplain General of the forces, and then the exhilarating, lilting notes of the long Reveille. To every soldier it heralds each new day and so it was for those who lay in this cemetery — a call to awake into the dawn of another life beyond this one. Earl Alexander, followed by the Civil and Military representatives of each Commonwealth country and Italy, then laid wreaths.

After the ceremony I walked among the graves and columns bearing the names of the dead. I saw the names of many of

my comrades not only of the Marathas but also of the other Regiments who fought with us.

My wife and I had seats in the first enclosure and next to us, in the centre, was the relatives' enclosure. Their thoughts must have gone back to the time when they had each lost a loved one. There were present wives and parents, brothers and children and there were also many who had fought in Italy. One old lady whom I met had come all the way from a remote corner of England; she had lost both her sons. What their thoughts were it is difficult to say. Sorrow and yet a feeling of peace were perhaps the overriding ones, for those who had perished in that turmoil of war had found lasting peace in this bit of Italian soil, removed from this our world of today where strife and turmoil have not ended. They lie in company with some 6,000 of their comrades in these green fields under the shadow of a house of God — the Abbey of Monte Cassino.

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## PLANNING DEFENCE INDUSTRIES

BRIGADIER B. D. KAPUR\*

**W**HEN new industries are being planned for defence, it would be of interest to review some of the problems that arise in the setting up of a major enterprise in a country like India.

It is generally realised that a nationalised enterprise cannot be run completely on commercial business lines. As large investments of public monies are involved, the red-tape in procedure is inevitable. The responsibility of the management is, therefore, apt to be too divided to lead to smooth progress. In addition to these handicaps, the foreign consultants play an important role in the organisation and planning of these industries. They have an overriding voice and if interfered with, the task would be difficult to accomplish without their technical co-operation. Where and when importance should be given to their views, calls for not only a high calibre of administrative experience but also an understanding of the technical implications of the problems involved.

In this article, the writer, who has had an opportunity of studying these problems, both as a planner and as an executive, has attempted to draw some lessons. These are the author's personal views and may prove of some guidance to those who are directly concerned with launching major industrial projects.

### ASSESSMENT OF REQUIREMENT

Before an industry is planned in the commercial world, an extensive "market research" is carried out to assess the quantum of requirement. This research or investigation leads to a study detailing the current requirements, productive sources, quality of goods produced, competitive price, and possibilities of increas-

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ed requirements by reduction in price or other possible causes such as expected increase in purchasing power of the population.

This part of the task *appears* to be easy so far as the requirements of the Services are concerned. But the demands as listed can never reflect the true picture: during the late war a very large variety of stores had crept into the Services due to the urgency of needs, which were met *ad hoc* from available supplies. An extensive and serious task, therefore, lies in front of the Services: to rationalise and standardise their requirements, firstly, within each service and then on an inter-service basis. In the U.S.A. it was found that by standardising the specifications of the blankets for the three Services, a saving of three billion dollars was effected during the Korean War!

No requirement for production planning has any value unless consideration is given to the period for which the demand may continue. Every modern Army aims at equipping itself with the most up-to-date weapons. Unless the trend of developments is borne in mind in forecasting any future demands, the General Staff, and the Air and Naval Staffs are not projecting their thoughts into the future. Consequently, costly wastages occur which give rise to stop-gap measures thus limiting the use of available funds.

As the needs of the Services appear to be known, the effort expended in "market research" is the minimum possible. "Any figure would do," is the line taken by the junior staff officer, on whom normally falls the responsibility for this calculation. Once computed, the figure is normally repeated up the chain of command, with double and re-doubled assurance that that was a true basis until the day when justification for errors begins to be expounded with the same vigour, resulting in an entirely different figure!

Any amount of research study at this stage would pay heavy dividends in establishing the industry on a sound footing. Exaggerated demands are risky and throw out all planning. Co-ordination and careful examination of these demands is therefore essential. Now that the Defence Production set-up has come into being, this should become its primary responsibility.

To make production economical, lumping requirements of similar nature of other government departments is necessary. In view of the present encouragement by the Government to each Ministry to set up its own factory, the tendency is to justify a separate factory under its direct control. This needs to be curbed in the interest of the country. The requirements should be prepared as a complete study. This study should establish the necessity for a new factory or for production to be developed within the country by expansion of existing capacity. How this coordination can be achieved, is a very important aspect in the setting up of new factories, and is therefore discussed further.

#### REVIEW BOARD

With the high tempo of industrialisation, coordination in industrial development at the national level has become all the more necessary. The tendency to accept the necessity for a new factory as soon as recurring demands can be justified, needs to be thwarted. Whereas every encouragement should be given to the growth of industrial capacity in the country, capacity already available should not be allowed to remain wasted. Even in highly industrialised countries, such as the USA, such a control is strictly exercised.

In my article on "Defence Production" published in the January 1954 issue of the journal, I suggested the formation of a "Factory Planning Review Board". This Board should be an adjunct of the Planning Commission. The object of this Board should be to consider all industrial undertakings on a national level. The terms of reference suggested were :

- "1. To locate idle existing capacity to avoid unnecessary expansion or construction.
2. To survey existing potential for expansion.
3. To survey requirements of machinery for new plants.

Projects would be put up to the Board from the Defence or other Ministries in the form of a proposal to construct, enlarge, or improve factories or to provide plant or machine-tools and equipment. The Board may suggest —

An alternate source of supply.

Using existing idle capacity.



- Expansion of existing potential.
- Adequacy of existing productive capacity.
- Re-screening machine-tools requirements.
- Deferment of construction.
- Acceptance of new enterprise.

All industrial projects other than utility and mining should be submitted to the Review Board. When matters of defence interest are considered, even in the case of a private enterprise, the Defence Production Organisation should be represented on this Board."

This would ensure the growth of a coordinated and integrated plan of industrialisation. Out of this examination would arise the need for the basic and ancillary industries which must inevitably come up in any new country. Potential sources with "dormant" capacities could be tapped to full advantage; more output for less capital outlay would be achieved. The economics of production would thus become the very basis for new enterprises.

Among complex industries such as electronics, no country among the European Powers is said to be 100 per cent self-sufficient. Much less achieve self-sufficiency within *one* major industry; they find it difficult to keep pace with the trend of development *over the whole field* within each country. The ancillary industries must grow and their growth can only be progressed if their necessity is planned when the major industry is born.

The 'Review Board' will thus be able to cater for all these needs. Without such control, haphazard and incomplete development of industries is likely to happen. An organisation like this is therefore a MUST for the Nation's planners.

#### OBJECTIVES OF THE COMPANY AND THEIR IMPLICATION

The government's policy in setting up any major industry is suggested as follows: making the best use of the resources within the country, to establish progressive *manufacture* of goods, development of which in course of time should aim at technical self-sufficiency. But this policy must be interpreted in its own

manner for each project and the fundamental policies of the company concerned enunciated by its own Board of Directors.

The writer is raising this issue here because generally speaking, the objectives of every government manufacturing concern would remain the same. It is therefore proposed to amplify the policy indicated above and give an appreciation of its implications.

### **Manufacture or Assembly**

There is a fundamental difference between manufacture and assembly. A normal industrial unit as understood in the Western World aims at assembly or manufacture of some of the components of that assembly. A self-contained manufacturing and assembly unit entails heavy capital expenditure and to make production economical aims at an output on a mass scale. For a company that has manufacture as its fundamental policy, the buildings, plants and layout are planned on a very much larger scale than an assembly factory. Problems of manufacture introduce diverse problems of production planning, design and scheduling. In addition it involves the procurement of production material and raw material. Success in the achievement of manufacture is therefore dependent upon the efficiency of the comprehensive organisation entailed and selection of suitable personnel to man the organisation.

### **Multi-factories and Single or Multiple Lines**

There is a tendency to group a number of factories as an integrated industrial unit. Besides the management problems, a lack of cohesion begins to develop within each sub-unit. There is however nothing unusual in the same management being entrusted with a group of factories. The policy of the government should aim at the development of an industry in such a manner that through its higher structural organisation the group may be able to exercise the requisite control. But to treat the major industry as one functional unit is beyond the scope of any modern industry in Europe, and this practice may be discouraged in India. Sometimes three or four factories are grouped into one integrated unit and planned as such when each factory has multiple lines of production which are specialised in themselves;

in such cases the administrative control becomes all the more difficult.

It is therefore suggested that in the planning of a major industry a clear indication should be given as to how this problem could be got over. Normally in any major industry multiplicity of lines of production would be set up. The question would arise whether these multiple lines could be divided into single lines of production in each factory or multiple lines in one factory where assembly only is required. Any decisions on these matters would have repercussions on the organisational structure of the industrial unit.

### **Technical Self-Sufficiency**

Generally the achievement of technical self-sufficiency is dependent upon the calibre of the nation and its research and development standards. No industry by itself can achieve any measure of self-sufficiency. But the contribution of the industry can be considerable, provided close coordination exists between the various elements in the country aiming at similar ideals.

Aiming towards early technical self-sufficiency entails heavy expenditure. A strange feeling exists in the mind of a layman that technical competence can be achieved within the four walls of a factory. During his tours the writer was surprised at the number of engineers, junior and senior, that were continuously exchanged between the major engineering concerns in Europe, USA and England. Personal and intimate contact (not necessarily at top levels, in fact very little at this level) at all levels, is the modern conception of achieving technical progress.

In this regard, finding suitable personnel is another major problem. Depending upon the engineering industry concerned, the wage structure has established levels in the world market. Any engineer of value has his demands. The electronics engineer is the highest paid in the USA today. If India wants men of competence, Indian or foreign, she must be prepared to pay them that established wage. Without men who have achieved a degree of proficiency in the particular branch of engineering concerned, technical progress will remain slow.

Another major implication of technical self-sufficiency is the large amount of investment involved in setting up research and development laboratories. This is a large "overhead" and is normally only allowed to increase when the industry is well set to a pace of profitable manufacture. In public enterprises one of the first objectives is the development of the technical effort. If, therefore, the government is desirous of stepping up this effort, it must set aside special funds as part of the national research and development plan.

It would thus be seen that the policy of the government before establishing a major industry, needs detailed consideration and examination in all its aspects before the industry can be embarked upon. Funds are always short, and limitations to any public venture must be accepted and made the basis of the development of any new project.

#### SIZE OF AN ENTERPRISE

For every enterprise there is an optimum size. Being under or over size involves a penalty. In America, the optimum size of a machine-tool company has been assessed as 60 men! There are various factors that would determine the size of an enterprise. These are considered in the following paragraphs.

#### What is the Capacity of the Chief Executive?

This seems a strange question to ask but the fact is that only people with big ideas can handle big things. If the conception of the extensiveness of a major industry is not there, the mind is too narrow and limited in its scope to achieve anything.

Again, an individual who has never controlled a body of men, is the least fitted for a top management cadre. He has never known how to feel the pulse of his team. Human beings have their own way of being moulded into an activity for the benefit of the community as a whole. And this technique can only come through experience.

The Chief Executive who has not been trained even in the rudiments of such knowledge will never be able to manage a major enterprise. It will be some years before such trained

men are available. Until they are available, the size of public enterprises might be kept down to small manageable units.

### Resources

An examination of the resources required for an enterprise is essential. Supervisors and technicians are difficult to obtain. It takes time to train them.

The material resources are dependent upon the scientific development in the country. Raw materials, particularly strategic raw materials, are always a problem. On the capacity to develop the requisite raw materials or to import them from abroad, will depend the smooth progress of the enterprise. Time and again these bottlenecks have presented themselves, thwarting all efforts to smooth progress, yet this one factor in setting up a major industry is constantly ignored; a superficial survey or enquiry is all that is normally attempted.

### Balanced Factory

Any factory which is not balanced in plant and machinery cannot achieve full economical production, nor maintain smoothness of flow of production. Yet there is a limit to which financial considerations will allow the factory to grow. The course selected must therefore aim at a plant which would produce the results required. Maximum utilisation of the existing capacity in the country but within easy reach of the industry concerned would help in partially solving this problem.

The general tendency is to order any and every type of modern machinery with all the attendant problems. A balanced plant is most important and will give better results than "one of each kind" in the machine shop. And even the plant required must bear a relationship to the overall economical considerations.

I have barely touched on the factors that should regulate the size of a public enterprise. Smaller, manageable units gradually built into corporations, would give quicker results than major undertakings beyond the capability and control of the average administrator available. It is sometimes thought that the Consultants are at the beck and call of the management

and hence the ease with which these enterprises should be managed. The powers of the MANAGEMENT are invariably centralised in the Managing Director or General Manager who is an especially selected officer. On him rests the complete responsibility for the management and administration, regardless of the advice of the Consultants.

#### CONSULTANTS

Immediately we embark on a new venture, we accept the necessity for a foreign consultant. The basic reason for this urge to get as many foreigners as possible, is that we have no suitable persons, both technically and administratively, competent to take charge of a major industry. This lack of trust arises from a lack of effort to find the suitable persons. Consequently, importance is given all the more to outsiders, who with all their ability to manufacture goods in their own country under fully developed conditions, in their own peculiar ways, find it difficult to adjust their ideas to our local conditions.

The main role of the consultant is to make available the manufacturing data and 'know-how'. In a new factory the contract also implies passing the *technique* and organisation for manufacture; but some of the consultants evade that responsibility as it means special efforts and hard work. In matters of organisation and management, they feel little or no responsibility and yet the means to convert material into an article are not mere machines but the men and the organisation behind the machines.

Another subject which is a major concern in commercial business, is the economics of production. No commercial firm would ever invest capital which is out of all proportion to the out-turn anticipated, yet in most public enterprise this ratio seems ridiculous at times. As one consultant put it to me bluntly: "We are out to do business on *our* terms and only a government can give us those terms."

The problem that arises in government-signed contracts is that seldom is a penalty clause admitted. Even if it is included, the Consultant seems to feel safer than in a commercial firm,

who would not hesitate to bring him to a court of law if the guarantees given were not fully carried out. Some governments also insist upon a penalty clause for every promise made; I saw one executed between a French firm and a European country. This ensures utmost vigilance and special efforts on the part of the consultants.

In the selection of a consultant various considerations arise. Politically we may ask any country to assist us but, in practice, there are very few countries in the world who have the requisite knowledge of the conditions in our country. Some are apt to consider us aborigines who will take a long time to be educated; others fail to realise the lag in industrialisation in India compared to their own country and hence the multiplicity of unknown problems which only show up when the spade work is begun. The climatic conditions are seldom fully appreciated; their surveys of the country are normally rushed and brief. And worst of all, howsoever experienced they may be in producing an excellent quality of goods, all consultants are not experienced in educating others into the same practice. If given the managing agency, they would do better than if asked to teach others to run the factory.

A major problem which is normally given the least importance in making these affiliations relates to language. It is a problem which can only be covered by a specific stipulation in the contract that those who are to be "moulded" to an industrial outlook must learn the language of the contracting party. In one contract where a French firm was assisting a European Government, there was a clause to the effect that every national joining the factory would be well-versed in French. Of all the nationalities in Europe, the French are the most conservative about their language. To have business associations with the French, therefore, one must learn their language, their habits and even simulate their idiosyncrasies!

The selection of a Consultant is, therefore, no easy task. Upon the right choice, with conditions to maintain check at every stage, will depend the success of a project. A senior Director of a major Swiss Armament firm once told me: "When I was a young man, an understudy in Krupps, for some time I

was the personal assistant to the Chairman. A major contract covering 15 pages was prepared for the Chairman's signature. The Chairman signed it without even reading a page. This shocked me as millions of pounds were involved in this contract. One day I ventured to ask the Chairman as to why he had signed without reading the terms. He replied: 'When a contract is laid out on one or two pages every word has a full meaning and must be thought out, but when it consists of 15 pages, there are sufficient contradictions to cover ourselves legally' ". A sure advice from an experienced industrialist!

#### APPOINTMENT OF TOP MANAGEMENT

Having selected the Consultant, views vary regarding the opportune time when the top management should be appointed. For an engineering industry, the writer would suggest the following team as the minimum :

Managing Director

Technical Director

} Or Managing Director only  
if he is also the Technical  
Director.

Controller of Finance.

Engineer-in-Charge Works.

The Technical Director should be associated with the project when the government has accepted in principle the necessity for the factory. He should be appointed as Project Officer and take part in all the deliberations. He may be given an opportunity to study the conditions in our own country and also to carry out a survey of similar industries in Europe and the United Kingdom. During the period the project report is being prepared, he should give all assistance and advice to the firm or firms concerned, by putting them wise about the Indian conditions. Such advice would result in a project report which should meet our specific requirements and thus save time in the expeditious development of the project.

Whilst the project report is under preparation, an engineer should be nominated to study the specialised layout of works and buildings. His advice with regard to building design under Indian conditions can save the government lacs of rupees. Those



not used to our climatic conditions have exaggerated notions of the size of buildings for India. At the same time construction work for a specialised layout needs study from the point of view of our engineers who are to undertake the work later.

The Finance Controller is normally an officer deputed from the government service. His outlook in the government organisations regarding financial measures becomes narrow and restricted. If commercial success is expected of our undertakings, the Chief Accounts Officers must develop a mental attitude in keeping with the business demands. This officer has therefore not only to study the various aspects of finance and accounting in commercial firms, particularly in similar industries, but also to frame the financial rules for the new undertaking. The right time for him to be appointed is when the contract has been signed.

The appointment of the Managing Director should also take place upon the finalisation of the contract. There are myriads of administrative problems: acquiring land, planning buildings and contract for construction, manpower training and recruitment, supervisory staffs, grades of pay, administrative rules and so on. It is too late to think of all these when the factory has started running; one has a sufficient number of routine problems to face then. Thus the framework of the organisation and its administrative structure should be completed as early as possible, so that all matters could be attended to in their logical sequence.

A word regarding the type of man required as a Managing Director would not be out of place here. I quote the first paragraph from "The Practice of Management" by Peter F. Drucker: "The Manager is the dynamic, life-giving element in every business. Without his leadership 'the resources of production' remain resources and never become production. In a competitive economy, above all, the quality and performance of the managers determine the success of a business, indeed they determine its survival." Of all the qualities, driving force and initiative must be predominant in the manager who must also have another very important qualification—human relationship.

A man detached from the factory can never enthuse a spirit in the organisation and without that spirit a factory cannot aim at being a national enterprise. Any amount of labour spent in finding the man would be well worth it.

### CONCLUSION

"Industries for Defence", is an important subject for any modern nation. With the emphasis on industrialisation in the country, defence must have its share of factories. The necessity for such factories is however challenged right at the beginning of this article. No country, howsoever rich, can afford to run in peace time factories for wartime production. The common practice is to develop the industrial potential of the Nation in such a manner that when an emergency demands, overnight the factories should turn out warlike stores. An approach to this method has been made in this article and this approach is by no means novel; it is practised by fully industrialised countries.

Slogans can be reduced to certainties when the implications of undertaking a major enterprise are fully appreciated. Watching other nations' rapid progress, the tendency is to put a pace on out of step with the technical competence of the nation as whole. Aiming at gradual progress up to the stage of stabilisation of manufacture and then full "heat on" would achieve better results than the urge to start at a high tempo.

One of the critics of nationalised industries wrote to this effect : "The only thing against nationalisation is that the undertaking is normally so big that it gets beyond the scope of those required to handle it". How big is the question? The administrative capacity of the Manager-in-Charge is the main limiting factor. We must therefore find and develop our Managers.

After the decision has been taken to accept the necessity for a project, the Consultants and the Management have an important role. Some of the problems that show up have been mentioned. But it is the conviction of the writer that problems would always arise with *any* consultant, although the nature and the complexity of the problems would vary. Proper selection of the consultants and timely phasing in the top management would reduce these problems considerably.

Finally, the writer hopes, that the Nation's builders might sometimes draw their inspiration from the spade-workers. Lessons have no value unless they can be critically examined and then taken advantage of. Repetition of mistakes is a crime and mistakes can only be avoided if the pioneers in the field of industry were given a hearing. The early formation of the Central Institute of Management would provide a good meeting ground for the planners and the builders. With all this background, we look forward with great hopes to a new era of industrialisation.

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## METHODS OF INSPECTION

COMMANDER M. R. A. RAO, I.N.

**D**URING World War II a very large number of people were employed in the U.K. solely on inspection work, which in the opinion of many manufacturers was a wicked waste of labour. This opinion is manifesting itself in India with the increase in the tempo of indigenous manufacture of Armament Stores and not only the manufacturers but also many responsible persons have given more than a passing thought to this view.

In the U.K., at the peak of the war effort, the number of inspection staff employed by the Services and other Government Departments reached an infinitely large figure. This army of inspectors was necessary for the inspection of components, projectiles and similar items made by repetition process. At that time no better inspection methods other than human examination and gauging existed. As the inspection then consisted almost entirely of "Hand Work", the huge labour force that such methods normally enforce was in fact a necessity.

In India today we are more or less in the same position as existed in other and highly industrialised countries some fifteen years ago. We are now considering alternative methods which would save expenditure by a reduction in the number of personnel employed on inspection. The object of this article is to examine each of these alternative methods and to show how they can be applied to advantage in our expanding organisations.

There is unfortunately a tendency even in the engineering trade to believe that, because new inspection methods have been given encouraging titles such as Quality Control and Controlled Inspection, such systems do all that their names claim. In practice this is not always true. Each system is limited in its scope and there are traps for the unwarily optimistic which are neither expounded in the lecture hall nor found in text books.

## APPROVED FIRMS INSPECTION

The system which must be considered first, because it offers most if found acceptable, is that which is known as "Approved Firms Inspection" (A.F.I.), i.e., self inspection by firms judged to be competent. This will most obviously solve all problems as all modern concerns are expected to run their own organised and usually efficient inspectorates except perhaps small contractors who may not have such facilities.

Some of the reasons and opinions in favour of this system are:

- (a) The aircraft industry in foreign countries with its especially important requirement of safety and reliability uses little else.
- (b) The Chief Inspector of Armaments in the U.K. favours it and is extending its use. This indicates an opinion which cannot be lightly overlooked.
- (c) It is not very different from the overseeing system upon which important Admiralty and Indian Naval Departments rely.
- (d) The Federation of British Industry is pressing for its adoption.
- (e) The D.G.O.F. in India and other Government manufacturing organisations are pressing for its adoption.
- (f) No less a person than the Master Cutler of Sheffield is supposed to have said at a luncheon, "One Government department has shown how to tackle this work. They believe that the man on the job knows better than any one else in the world whether he has done it correctly and they have had sufficient faith to leave him to do it. It is time that other services took a leaf out of that work and ceased delaying production as they are doing now. If this were done, a considerable saving in man-power could be achieved, there would be quicker delivery and the products will still be to the same specification".
- (g) A.F.I. would save the Government half the expenditure now being incurred by way of wages to person-

nel, cost of equipment and also a lot of other headaches.

The above is certainly a formidable case in favour of A.F.I. but now let us also consider some of the arguments against it.

- (a) In the U.S.A. the need for independent Government inspection has been challenged and exhaustively investigated. The result covers pages; there is only space here for two short extracts from the conclusions. "Government inspection is required because first, the consequences of defective materials, incorrect material, etc., are sufficiently serious to make inspection a necessity. Secondly, Government Inspection, rather than sole dependence upon the Contractors' own inspection and/or warranty, is necessary to prevent acceptance of defective material". "In War time periods" (and to a great extent during re-armament) "there is still more reason for Government inspection. At such times most civilian companies necessarily have a considerable influx of new personnel because of increased production demands and loss of skilled personnel to Armed Services".
- (b) The U.S.S.R. evade the difficult question of Government inspection by applying the death penalty to manufacturers failing to meet specifications. Even this is believed to be less effective than Government inspection.
- (c) In the U.K. several of the best and most experienced firms have expressed complete satisfaction with inspectors from the Naval Ordnance Inspection Department and in some cases have actually protested against any suggestion of their removal, maintaining that their value far outweighed the inevitable delay, etc., which they may cause.
- (d) The reply to the aircraft industry and to the practice of overseeing is, of course, that aircraft and their engines, etc., can be and are, tested and retested repeatedly after completion. So are Marine engines, electrical circuits and so on. Ammunition on the other

hand can mostly be used only once and must then function perfectly as well as being safe to store, handle and operate with its explosive filling or components. This point even extends to such things as packages since a safe and serviceable store can be quickly rendered both dangerous and useless by defective packing.

- (e) As to the master cutler's concluding phrase (the products will still be to the same specification) experience unfortunately includes such things as plain carbon steel stampings found amongst stainless, mild steel bars mixed with shell steels, firms chemical analysis methods being unreliable, mild steel plates mixed with those of alloy steel, forging of inspection stamps to secure acceptance of material below specification, repeated submission of rejected items in the hope of Naval Ordnance Inspection Staff being caught asleep, brazing of specially poured brass test pieces to stores in a foundry of international repute and so on. These incidents must not always be taken to imply dishonest firms, they usually arise from carelessness, unsuspected weakness in organisation, payments by results, operative's effort to hide their mistakes and other such causes.
- (f) As a set off against the saving in the wages of inspectors and equipment it happens to be a fact that it costs the country more if firms inspect their own products than if inspection is done by an independent Government organisation.
- (g) Above all, in India manufacturers do not have at present even a semblance of an organisation for undertaking A.F.I., and considering the infancy of the vast number of industries their limitations in finances and the severe handicaps imposed by the shortage of skilled labour and tradesmen in the country as a whole, any resort to A.F.I. methods will lead to nothing short of a national disaster. We are not short of manpower as may be the case in other countries, we are short of money and the trained men to do the job and as such

there is a lot of truth in the adage "the known devil is better than the one unknown".

All the above arguments for and against A.F.I. constitute a point of principle about which there can be no hedging. A plain answer is required to the plain question "Will A.F.I. ensure for the services the stores of the quality they have a right to expect?" The answer is "No", even should the manufacturer be a Government organisation. A.F.I. means passing the baby into hands that cannot be expected to hold it unsupported and retreating from the responsibilities the inspectorates exist to shoulder. Nevertheless, there are ways and means of utilising manufacturers' facilities and procedures thus reducing duplication to a minimum and regaining most of the savings AFI offers.

Let us now proceed to review a few of the methods of inspection which can be used for reducing the work of inspection or to gain other advantages. There is no intention to pretend that all possible variations are mentioned, and the titles under which they are listed are not always orthodox, but they are typical of what can legitimately be done.

#### LINE INSPECTION

This consists essentially of inspecting dimensions as they are fixed by the machining operations without waiting until the article is finished in all respects. The advantage is, of course, that time and money are not wasted in the later machining operations on an article which is already bound to be rejected in the end. It does not save inspection effort since the same gauging or checking is required although it is split up and carried out at different points instead of all in one bond; in fact, transport, the remaining necessity for the final bond visual inspection, etc., have the effect of adding up to slightly more over all inspection effort. It also calls for a complicated and difficult organisation if it is to be effective because the flow through the shops is liable to be interrupted at any point and allowance must be made for this. Thus, the advantage to be gained is entirely economy for the manufacturer. It can be operated by the inspectorate or by the manufacturer with checking by the inspectorate, but the total inspection effort remains slight-



ly above the ordinary final bond inspection and it must not be allowed to degenerate into progress inspection in aid of the manufacturer.

#### BY MACHINE

This relies on the use of machines of sufficient accuracy in themselves to ensure production of practically identical articles provided, of course, that they are set correctly. Where this assumption can be made, it will be enough to make sure that the first few off are correct, after which a number can be accepted as also correct without further inspection. The number which can be so accepted depends upon the rate of wear of the machine tools. This is soon learnt by taking check inspections at intervals, thus establishing how fast wear has taken place and therefore how long a run can continue uninspected.

There are two ways of using this method with an important difference between them. If gauges are used for inspection there will be no warning of when a machine is about to go "out of control" either by reason of wear or of initial setting not far from the limit of wear. To overcome this, it is necessary to arrange that all production between checks is held back or isolated until the next check, so that if the latter rejects a 100%, back check can be made to the previous periodical check. If inspection is by measurement, the wear of the tools can actually be watched and plotted, which allows a machine to be stopped for re-setting before it begins to produce rejects. Naturally the latter method is preferable, since not only is no material wasted, but there is no disorganisation of the flow for back checking. An ideal way of operating this method (by measurement) is to allow the manufacturer to keep a plot, by means of fairly frequent checks and for the inspectorate to verify the plot by occasional independent check.

#### BY DIE

A punch and die in good condition, of given dimensions and adequately forced home can only produce an article of certain dimensions and it follows that so long as conditions remain the same, the product must also remain the same. In fact, the die may be regarded as itself a gauge which not

merely tests for but ensures correctness. If, therefore, the die is inspected, the product may also be regarded as inspected. The simplest way to inspect the die is, of course, to inspect the first few off.

If the die is made of very hard material and the material of which the articles are made is relatively very soft, an immense number of articles can safely be allowed through without inspection, the rate of wear of the die being ascertained by periodical checks on the product. As in the case of inspection by machine, it is preferable that the check should be by measurement rather than by gauge. Wherever the material used for the manufacture of the article is tough and resistant and therefore causes a high rate of wear, inspection on these lines will not be worth while as compared with the straightforward inspection of the product.

#### By Jigs

Provided that jigs are controlled in the manner of gauges, their use, like dies, may obviate the necessity for gauging of the product to a greater or lesser extent. An exception to this is jig-welding as the factors of heat distortion are unknown.

#### By ASSEMBLY AND FUNCTIONING

Where assembly of small groups of components is carried out in the same works as the manufacture of the components, much dimensional inspection of the components may be unnecessary; if they will assemble, they are acceptable. Experience has shown that sub-contracted or free issue of the components wreck this system. The opportunity may therefore be taken of using assembly in the place of inspection. Many designs take this possibility into account but there is an absolute limitation on this method which is, that there will never be a requirement to take the assembly apart and re-assemble it with different components. In other words, there is no requirement for inter-changeability amongst the components. Care must also be taken to see that no single component has a separate and vital function, e.g., a heat relay may assemble but if too thin will transmit heat too quickly. While, therefore, inspection by assembly can save a very great deal of inspection

effort, intelligent analysis from the functional aspect must precede its adoption.

#### TYPE APPROVAL

There are occasions when all ordinary forms of inspection of material followed by dimensional inspection are ineffective if not impossible. This may be found for example when assembly requires special skills upon which the efficiency of the complete article will depend to a greater extent than any other consideration. In such cases the best that can be done is to inspect and test the first off, thus in effect testing both material and dimensions of components and also the skill of the manufacturer. Production can then be allowed to go ahead with check of samples at intervals.

This is not a method of inspection which should ever be adopted when it can be avoided. It should be confined to cases where no other form of inspection can be effective. Dry batteries now form an outstanding example and most other examples are in the electrical field. It is often possible to carry out non-destructive spot checks in addition to Type approval as is done with dry batteries.

#### BY X-RAY

Time was when the only way of ensuring that components were present and correctly placed and positioned in an assembly was by watching each operation of assembly. This absorbed an immense number of examiners (lowest grade of inspection staff) and the very nature of the task was so dull and monotonous that even this was unrealistic and unreliable. This difficulty is particularly present in the case of fuze assembly, both empty and filled, when the omission or wrong position of a component is liable to cause prematures and fatal accidents. Nowadays this difficulty can be overcome, economically in labour by X-Ray of the finished and filled article. There is a considerable technique involved but it is possible to make the operation more fool proof and reliable than anything else serving the same purpose. The limitations of this method usually reside, of course, in the thickness of the material which needs to be penetrated.

## BY STATISTICAL SAMPLING

It must be emphasised that statistical sampling can only be used when an appreciable proportion of defects is acceptable, i.e., it cannot be used for dimensions where the requirement is that NO defects are admissible for reasons of safety or inter-changeability. Mathematicians have produced pamphlets, treatises, and whole books on this subject; it is not proposed to go into details here. The purpose of this method is to ascertain to a high degree of probability the percentage of defectives in a bulk which is regarded as acceptable. Where this level is not reached it must be followed either by 100% screening or return to the manufacturer of the bulk. An important point to remember is that it is meaningless for inspection purposes unless the bulk is homogeneous, i.e., each article is closely related in every way to every other article in the bulk.

## PROOF

Theoretically it should be possible by close material, dimensional, filling and assembly inspection to ensure that the product is uniform and uniformly correct. Assuming that the design is sound there should be no necessity for proof which is a destructive and expensive proceeding. Unfortunately there are limits to the degree of accuracy to which it is possible to work. This statement applies to all stages in the manufacture of ammunition but particularly perhaps to heat treatment of material, chemical processes and electronic features. Proof, therefore, remains a practical necessity.

Of the carrying out of the proof itself, little can be said although it requires care, judgment and intelligent appreciation of its objectives; it should always aim to represent the worst conditions to which a store may be legitimately subjected in service. Assuming that it has been carried out realistically, it remains the function of the inspectorate to sentence the bulk governed. A great deal of nonsense has been written on this subject, much of it under the heading of "Rational Sentencing". The point is, of course, that all sentencing must be rational; that it should be irrational is manifestly absurd. So called "Rational

Sentencing" is both inflexible and difficult to mix with common-sense. When tried, it was found to coincide with the untrammelled judgment of experienced inspecting officers in simple cases, while in more complicated situations the judgment of such officers was quite clearly to be preferred since it was able to take into account variations in proof, filling and other conditions which could not be allowed for by any set rules.

Proof sentencing is not too distant a relation of statistical sampling and, in fact, the principles of statistical sampling could be used if the amount of proof involved were not inordinately extravagant. Provided, however, that the run of work or filling concerned is reasonably uniform from batch to batch, related principles can be used. The sentencing of individual batches of production arbitrarily divided numerically is, of course, irrational. Only where batches are divided by some such consideration as a change of material can they readily be treated on an individual basis. Otherwise sentencing must be based on running consideration of successive batches resembling a statistically significant sample. It follows that heavy proof should be taken from the first batches of a run of manufacture in order to accelerate the assessment of quality, factory managements being induced to accept some delay at this stage. Later, provided production is satisfactory and there is no known change in material, manufacture or filling batches can actually be released in anticipation of continued success of proof. In short, efficient proof sentencing requires knowledge of all the processes which have gone into the final product and of the purposes and conditions of service use, careful consideration of prevailing conditions and a little arithmetic. There can be no simple directions for universal application.

It is hoped that the above short comments may be of some use in clarifying the very confused thought that exists on the subject of inspection today; the most important is, of course, the subject of proof, since the "Proof of the pudding is in the eating" and the proof should represent the eating. I now proceed to round-off the ragged remarks above, which is all that can be compressed into a short space.

## THREE QUESTIONS

Material inspection is the simplest in one respect at least; there are only three methods of test, i.e., chemical analysis, physical testing and non-destructive testing. This does not, however, mean that the methods themselves are simple. On the contrary they are quite outside the scope of this article. Neither is it intended to imply that the task of the material inspector is child's play. The current tendency is to work to a small number of broad specifications. In fact designers are often able to and do specify from a group of specifications so that they might almost write "any old steel will do". This is supposed to aid procurement. Whether or not it aids procurement, it certainly does not aid inspection. Blind application of specifications does not make a good inspector. The inspector must always ask himself at least three questions even in the simplest cases.

(a) What is the material going to be used for? He will find in the case of metals that for the same quoted specification the critical requirements may be strength or resistance to fatigue or weldability or machineability or freedom from porosity or resistance to corrosion, etc., and sometimes special attributes such as conductivity or co-efficient of expansion or any combination of such features. Only when armed with the answers to this question will he be able to decide which tests to take and insist upon rigidly and which he may concede or waive. Since most material is on sub-contract from sources other than where the store is to be manufactured, it is essential that inspectors for the stores as well as for the material maintain close relations with each other. The Inspecting Officer responsible for the inspection of the store is entitled to have a say on any proposed relaxation or concession by the Inspecting Officer responsible for the inspection of the material. There is here an absolute need for user and design knowledge.

When material is ordered for stock it must necessarily comply with all specification requirements since the ultimate use of it is unknown.

(b) How far does the method of manufacture ensure uniformity? Since both chemical analysis and physical testing are

destructive they must be on a sampling basis and the degree to which these samples represent the bulk is all important. On the other hand, many stores have to be fabricated by rolling, bending or welding. Frequently their ability to withstand this treatment is sufficient proof that the material is adequate for its intended purpose. The answer will govern how many samples he takes and from what part of the bulk. Non-destructive testing methods in their application to materials, enable us to look inside a mass, thus extending our powers of inspection and on a comparative basis enable us to check larger numbers of similar samples quickly but they are still in their infancy as a means of obtaining accurate and absolute information.

(c) In the light of the answers to the first two questions, what is the least amount of testing required to cover the prime responsibility to the user? Specifications must be framed to give the inspector sufficient authority to check all characteristics that he may want to check and the broader the specification the more this is so. Material testing, however, necessarily expends time in spite of the fact that close and continual consideration is given to every means of expediting it, whether by close co-operation with testing Laboratories of the Inspection Department or by the use of manufacturer's facilities where they are available and acceptable. Any unnecessary testing, therefore, bearing in mind the packed bonds of the producer, the impatient fabricator and the prospective receiver and the pressing need for economy, must be accounted against the efficiency of the inspector.

The HQs of the Inspector can help by making requirements as clear as possible at the review of design and specification stage thus reducing the demand on the inspector's discretion, but such review can only be undertaken when the supply position of material is known.

#### SUMMARY

To summarise all that has been said in this article one conclusion is outstanding and indisputable, which is that the only ideal method of inspection of important and dangerous things is to station on the doorstep of every firm or Ordnance


Factory an Inspector with adequate user, design, and technical, one might say semi-scientific, knowledge. The attainment of such an ideal is obviously not practical. The only practical way of achieving the object is by intelligently appreciating the problems involved and evolving a compromise without letting considerations of vested interests, built up Empires and what not to interfere at any stage of its planning or future working.

What steps we shall take to evolve this formula is entirely in the hands of the departments concerned and also in those of the Government taking into consideration the following:

- (a) Availability of facilities.
- (b) Availability of technical personnel with adequate experience.
- (c) Availability of funds.
- (d) The speed with which it is desired to proceed with indigenous manufacture.
- (e) Geographical dispersion of centres of production and availability of effective, speedy and economical means of communications.
- (f) Availability of raw material.

There is no denying that all the above facilities are available to us only in a limited degree, while it is our desire to proceed with indigenous manufacture of all stores required by the services at as rapid a pace as possible. Another limitation is the geographical location of the various production centres, and the relatively undeveloped private sector of industry. With all our drawbacks and with our intention to proceed with indigenous manufacture at a fairly fast pace we cannot afford to experiment with organisations that will be required to achieve our aim, but on the contrary we will be well advised to adhere to the already tried methods of a few other countries such as the U.K. and the U.S.A. and either adopt their systems in toto should these meet with our requirements or adopt the salient points from each of their systems to suit our conditions. In the U.K. the system is to recruit specialist service officers of not less than a set minimum of user experience, improve their technical and scientific qualifications in the armament field,





employ them in design and other technical posts and then send them out as inspectors, reverting them periodically to design and experimental work and keeping them in contact with their parent services as far as possible. Also the country as a whole is divided into inspection areas so that the HQs of an area is not more than a hundred miles away from the various manufacturing centres, with the result it has been possible for them to decentralise the various responsibilities attached to the inspection effort to the various area officers who not only accept and reject stores but also advise manufacturers on methods of overcoming difficulties and in reverse consider and promote producers' own suggestions. This method has not only developed a close harmony between the manufacturer and the Inspector but also has led to sentiments as are expressed in the article "Are we still winning Commander" (Naval Review—May 1952).

The system followed in the U.S.N. is designed to deal with a large volume of work at centres which are geographically very widely dispersed and is a highly centralised and elaborate one. In effect this system ensures compliance with drawings and specifications with greater rigidity than in the U.K. and involves the use of a large number of office staff. It also means much longer delays in getting decisions in doubtful cases.

We in India have to date worked to a modified British system which in effect has decentralised the inspection effort but not the inspection responsibilities. Again this system has suffered greatly by virtue of the fact that the centres of production are so widely dispersed and almost all day-to-day problems have had to be dealt with by voluminous correspondence, the originators of which on occasions could not really be expected to appreciate the local conditions. There are signs, however, that we are leaning towards the centralised system of the U.S.N. with the formation of the C.G.D.P. organisation whose aim is to co-ordinate the inspection, production, development design and procurement effort connected with stores required by the services. There can, however, be little doubt that if this organisation is to deal with all the stores (armament as well as general stores in addition to aircraft manufacture, ship-building, etc.)

of all the three services and at the same time liaise with the civil ministries for the procurement of raw material, location of idle capacity in the civil trade, utilisation of idle capacity in Ordnance Factories in peace time to meet civil requirements, etc., it will have to be a vast and versatile organisation adequately staffed and the entire organisation will in the first instance have to be planned on a very sound footing by giving due consideration to almost every problem that is likely to arise and the machinery that will be required to tackle such problems efficiently and speedily. The plan then will have to be implemented in phases. To bring schemes such as this to fruition, it requires deep thought, careful planning, ruthless implementation and above all a desire from all quarters to make its function a success.

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## ARMOUR IN STATIC ROLE

MAJOR O. D. P. RATNAM

**O**FFENSIVE action and concentration are accepted principles for employment of armour, be it in the attack or defence.

There appears to be little said about using armour defensively, especially in positional warfare, in unfavourable tank country and when the frontage covered by the defence allows it. An unfavourable tank terrain necessitates a departure from the normal principles. The purpose of this article is to show briefly the method by which tanks can be used in a static role, especially in a defended position.

### DEFENSIVE ACTION

Although the aim of any defensive operation is the destruction of enemy forces, a defensive action is normally fought with the intention of either gaining time to launch the offensive when conditions become favourable or economizing in one area to be able to concentrate superior forces in another area. As such, conditions arise when certain positions have to be held at all costs.

These positions are held by the infantry whose task is to defend them. The presence of a tank in their midst is a great morale booster. The task of the tank in such a static defence is to provide anti-tank protection to that position. Besides, it can reinforce the fire-power of the other artillery and infantry weapons and also do some quick local small scale counter-attacks. There is no denying the fact that a tank does definitely dominate a certain area around the place where it stands. And a tank is the best weapon to fight against another tank.

### ANTI-TANK LAYOUT

An essential part of an anti-tank defence is deception and careful coordination of fire of all weapons. The procedure for organising the anti-tank layout of any defensive position is laid

down. The tank force commander assists and advises the infantry commander on the anti-tank defence of the area. After a thorough reconnaissance and planning, tanks are allotted to sectors where necessary and a reserve, if possible, is also maintained. The depth to the anti-tank defence is given by some additional tanks and if no additional tanks are available, even the reserve can be used to extend the depth. In a prolonged defence, the reserve tanks can also be used to relieve the front-line tanks periodically.

#### SITING OF TANK POSITIONS

Selection of firing positions is the first task of the tank commander. They should be sited to cover tank approaches first. Their ability to engage soft targets and enemy infantry with HE and machine-gun fire becomes only a secondary task. Primary, alternate and subsidiary positions for each tank will have to be prepared and some of them will have to be dug in too.

Tanks should be distributed laterally to stop enemy tanks before they overrun the front line. Tanks sited in the rear to provide the depth should be able to destroy the tanks which have penetrated the front-line area. Reserve tanks, if any, should not normally be used to stop this penetration because it would then become difficult to concentrate these reserve tanks for local counter-attacks which have to be extremely quick in execution. Plans for counter-attacks will have to be very flexible because the number of tanks supporting or doing the counter-attack can never be foretold and will vary with the conditions then existing.

Positions should be mutually supporting and afford maximum concealment and cover. They must be camouflaged well. The best field of fire is not the longest but most cunning. For security at night, firing positions have to be located near or inside the infantry areas. But all the same, infantry must learn to expect anti-tank fire forward of their positions without necessarily having the tanks next to them. Tanks should not be dispersed over a wide area because the fire effort will be decreased and the difficulties of command and supply will be increased.

#### OCCUPATION OF POSITIONS

There are two ways of occupying the prepared positions. The first is physically to occupy all of them. This has the advan-

tages of getting a number of good accurate shots at the earliest, early surprise and boosting the morale of the infantry. The disadvantage is the long time the tanks will take if they have to move off to reinforce another sector, and the tanks sited individually all along the front line could not be mutually supporting.

The second method is to be in their hides on forward rally and move off to any pre-selected positions as the occasion demands. This has the advantage of concentrating all fire from one place but has the disadvantage of being exposed and seen while moving to position. These tanks should not take a long time to reach their positions as the routes to these positions would have already been reconnoitred and improved. This method has also another disadvantage of not being able to fire at the earliest opportunity and some good fleeting opportunities to shoot down the enemy tanks may be missed. The method to be adopted will depend upon the terrain and the type of attack expected. In any case, the tanks will have to use the first method at night.

#### TANK TO TANK ACTION

In a tank versus tank battle, the following factors normally become decisive :—

- (a) Lightning appreciation of the situation and the ground and instantaneous action taken by the commander on the spot;
- (b) Finding out quickly the strength and direction of enemy tank attack;
- (c) The knowledge of the mechanical and fighting characteristics of enemy's tanks and their tactics.

The correct way to deal with an enemy armoured force is to hold its attention or to pin it down to the front by a few tanks, while a strong force makes its way to the flank or rear of the enemy force, and then attacking it. To do this the enemy's flank should be located as early as possible.

In a reasonably organised defensive position, enemy tanks cannot, all of a sudden, appear unexpectedly. But if they do, an effective smoke screen will have to be put down quickly in

front of the enemy tanks so that own tanks can conceal their movement and get into an advantageous position to shoot at the enemy tanks.

Full use must be made of manoeuvre. Firing positions must be changed very frequently. The effect of surprise and shock action will be increased by opening up from unexpected directions. The battle for the outer flank of the enemy will become the most important during the actual fighting and manoeuvre.

Fire should be opened as late as possible and at the same time one must not be deceived by feint attacks. The commander must not be influenced by small local penetrations. But at such moments, ammunition must not be spared. The enemy must hear and feel the weight of the defence. This brings up the important point that ammunition must be stacked at all firing positions to last at least for one day's heavy defensive fighting.

Dusty and dry ground will reveal the movement of tanks and if surprise is intended, the movement has to be slow unless that surprise can be achieved by sheer speed regardless of the dust. Once they have reached the area, the tanks must spread out to conduct the fire fight. While doing an outflanking move, if own tanks contact enemy tanks, the fact that stationery tanks have an advantage over moving tanks must not lead own tanks to freeze in their tracks waiting for the enemy tanks to make a move.

During these moves, if the enemy tanks show any attempts at evasive action, they must be pursued and outflanked or their retreat cut to destroy them. This must be done in close conjunction with a light, slow speed, reconnaissance aircraft which will be able to locate the enemy tanks. Care must be taken, however, to avoid running into an ambush.

#### DECEPTION

Deception and surprise play a very important part in anti-tank defence. Ambushes and traps can be easily planned. When tanks are dug in, concealed and defiladed from enemy's observation, it is better to let the enemy tanks ride into the field of fire and surprise them by opening fire at a close range.

Concealment and camouflage must be of the highest order. It was reported that the Germans in the last war made their tanks look like 3-ton troop carrying vehicles by attaching tin skirts around, when the tanks could not be concealed. Natural camouflage is important. The aerial sections and gun barrels betray the tank from the ground while the tracks give them away from the air. Aerials should be fitted either horizontally or slantingly.

Dummy positions and dummy tanks are very effective in drawing enemy fire. These should be built some distance away from the real positions to act as a decoy. These dummies must be chosen so that they not only alter the enemy's movement but also disperse his fire. Roving tanks should fire an occasional round from the dummy positions. The test is that the enemy tanks must fire at them because tanks cannot carry much tank ammunition.

Smoke can be used very effectively not only to blind the enemy's tanks but also to create surprise by moving on to his flank, provided the wind conditions are suitable and the commander uses it intelligently.

Baiting tactics can be employed by the light gun tanks leading the enemy tanks into a trap of carefully sited and hidden medium gun tanks. The first tanks to open fire should be those sited right at the back. Enemy tanks' attempts to run away or outflank should be thwarted by tanks on the flank.

Own tanks should first try to knock out the enemy commander's tank. Experienced or intelligent tank men can quickly recognise it either by its special marking or by its behaviour in action.

#### RANGE CARDS

In static defence, range cards should be prepared for all positions. Thorough reconnaissance by the tank crew by walking over the ground they have to fight on and actually measuring the distance in their different fields of fire will ensure good tank gunnery whether at night, in smoke or in mist.

#### TANKS AT NIGHT

Tanks should not be considered as blind and deaf. They should be able to fire on fixed lines at night and even support

the infantry in local quick counter-attacks at night. Night training must be carried out from the actual positions to recognise various targets at short ranges from 200 to 300 yards. Although every tank cannot have an infra red ray equipment, at least two tanks per squadron fitted with that equipment will be of great help. Use of spot lights and flares must be practised.

A radar set in the rear will be useful to find out the main direction of enemy's expected armoured thrust.

#### DIVISIONAL REGIMENT ARMoured CORPS

Since a tank is the best answer to another tank, the Divisional Regiment Armoured Corps is the right formation to provide anti-tank protection to the division. But tanks can be given to the infantry as a part of the division only when there are enough armour available. With limited armour, it is doubtful whether it would be correct to distribute the tanks to the infantry instead of forming an armoured brigade or even armoured division! Perhaps, the best answer would be to strike a happy medium which is to keep the tanks concentrated and allot them to the divisions only when necessary.

#### CONCLUSION

Tanks in a defensive role demand a thorough reconnaissance, planning and coordination of fire of all arms. There should be enough room to manoeuvre inside the defensive area as well as in front of the positions. Mobility must be exploited, otherwise tanks will become mere towed anti-tank guns.

Use of tanks at night should be natural. Radar can be used to locate enemy armour. Use of spot lights, flares and artificial lighting must be practised. Deception must be an essential part of anti-tank defence and novel and original ways must be devised to deceive the enemy tanks and to destroy them by surprise and shock action.

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## THE BATTLE OF FEROZESHAH

### A STUDY IN LEADERSHIP

Sqn. Ldr. D. R. SETH, I.A.F.

NEVER before in the history of British conflict with Indian States, did the British army come so near defeat as on the battlefield of Ferozeshah (21-22 Dec, 1845). And yet never before in the whole history of human conflict had an army fought under more adverse circumstances, as did the Khalsa Army on that day. Unsupported by their own government, led by treacherous commanders, who were traitors at heart, faithful only to their own interests; who instead of leading gallantly their gallant men did not want to push the enemy too hard lest their own future be marred; leaders who wanted to put up only a token resistance and thus build credit for themselves with the enemy.

Incredible, but true. Had the Khalsa Army been led by generals it deserved, the history of India might have taken a different turn.

No campaign in history brings out more clearly the importance of leadership. Good fighting material is necessary and so is training. But the best soldiers in the world, most superbly trained, cannot win battles without proper leadership. It was leadership which won the day for the British and the lack of it which denied victory to the Khalsa when it was within their grasp. The British were led by experienced generals, Peninsular Veterans like Sir Henry Hardinge and Sir Hugh Gough. While on the other side the commanders were men like Lal Singh and Tej Singh who were not above telling the enemy their plans and dispositions and were cowards at heart.

The story of Ferozeshah is also one of thrilling interest for its high drama of the midnight bivouac, when the British Governor General and the Commander-in-Chief, with their staffs dead around them, prepared to sell their lives in the morning. It is

a story of utter bravery, the burning camps, the missing brigades and of Khalsa heroism burning like a lambent flame. It is also of the battlefield of Snarleyow and that "batt'ry of the corps" of which Kipling sings.

#### THE ORIGIN OF THE CONFLICT

Ranjit Singh, the founder of the Sikh Kingdom of the Punjab, died in 1839. His sons, who succeeded each other in quick turn, were unworthy, incapable men, too small for his shoes. Intrigue became the order of the day at the court of Lahore. With weak rulers on the throne, chiefs intrigued against each other to achieve power and position. All semblance of authority disappeared. The only stabilising factor in the state was the army. Its favours were wooed, but not a single man arose to command its respect. The army became not only independent of the administration, but virtually the master of the state. If another Ranjit Singh had come on the scene, he could have easily restored law and order with the help of the army and ushered in a new and even more glorious era than the previous one.

But this was not to be. The incapable and selfish chiefs stood rebuked before the superior genius of Ranjit Singh and before the mysterious spirit which animated the Khalsa Army. This bunch of traitors, who clung to wealth and ease rather than to honour and independence, were ready to become tributary and to lean for support upon foreigners. They considered the authority enjoyed by the army to be a threat to their own power. Gulab Singh, Lal Singh, Tej Singh and many others who should have looked upon the army as the sanction behind their authority, were on the other hand afraid of it. They considered that their only chance of retaining power was to destroy the army by bringing it into conflict with the British. They believed that this would pave the way for their recognition as ministers more surely than if they did their duty by their people. So every defensive measure that the British took to protect their territory was misinterpreted to excite the army.

Nor did the British hesitate to oblige them. The policy pursued by them after the death of the great Maharaja was not

in reality well-calculated to ensure the continuance of friendly relations. Their acts were far from wisdom and foresight and could easily be misconstrued by the Sikhs as a plan of conquest. The opening up of new cantonments on the north-west frontier, and the manifold increase of troops and guns stationed in them; the declaration of the Cis-Sutlaj possessions of Lahore to be under British protection; the bringing up to Ferozepur of a number of bridge-boats made in Bombay and the exercising of their crews after arrival, were measures both provocative and untimely. Had the shrewd committees of the Khalsa Army observed no military preparations on the part of the British they would not have heeded the insidious exhortations of such traitors as Lal Singh and Tej Singh. But the views of the Wazir and the Commander-in-Chief coincided with the belief of the army; and when the men were tauntingly asked whether they would quietly look on when the Khalsa dominion was being threatened by the remote strangers from Europe, they answered that they would defend with their lives the independence of their country, and that they would march and give battle to the invaders on their own ground. The men began to assemble round the 'samadhi' of Ranjit Singh and vow fidelity to the Khalsa.

On the 11th December 1845 the Khalsa Army crossed the Sutlej. The die was cast.

#### THE FIRST ROUND

The Khalsa Army had a very good opportunity to strike a winning blow. The main British army was still dispersed and many days' march away, and the small force under Littler at Ferozepur was completely isolated. But nothing of the sort was done. Under the influence of Lal Singh and Tej Singh those precious days were wasted. A bold and sagacious leader would have found it easy to destroy the enemy in detail. But boldness and sagacity were both conspicuous for their absence in the councils of the Sikh leaders. Ferozepur was threatened but no attack was made upon it. The object of Lal Singh and Tej Singh was not to compromise themselves with the English by destroying an isolated division, but to bring about the destruction of their own army by allowing the British time to collect their forces and concentrate for the blow. They, therefore, urged the

necessity for leaving the easy prey of a Cantonment untouched, to attack the British leaders, and thus to exalt the fame of the Khalsa by captivity or death of the British Governor-General and the Commander-in-Chief.

The main body of the Khalsa army under Lal Singh entrenched itself at Ferozeshah, and another division under Tej Singh screened Ferozepur. A week passed idly by. On 17th December information was received that the British army would arrive at Mudki the following day. Here was another opportunity for the Sikh leaders. They had 30,000 men at Ferozeshah and the British would be only 11,000 tired men. How easy then to surprise and overwhelm them. Any general would have caught this opportunity with both hands, but not the Sikh generals. Instead of marching out in full strength they detached only a brigade consisting of less than 2,000 infantry, supported by twenty-two guns and 8,000 cavalry. It was under these auspices that the battle of Mudki was fought. The main strength of the Khalsa army at Mudki lay in their guns. The infantry was a mere handful against the superior numbers of the British.

The first move was made by the Sikh Cavalry which charged the British flanks. They were in turn charged by the British Cavalry. Under the cover of this charge the British infantry advanced to the attack. The Sikhs, outnumbered as they were, remained firm, and opposed the British advance by a continuous and steady fire. All at once, their flanks were uncovered, the cavalry having given way. But the Sikh infantry was still undaunted, retired steadily with their faces to the foe, disputing every inch of ground, and seizing every vantage point to turn upon their pursuers. With nightfall only did the contest cease. The remnants of the Khasla fell back upon their main body at Ferozeshah. They lost most of their guns, and they lost the battlefield, but they did not lose their honour.

#### THE BATTLE OF FEROZESHAH

Lal Singh had occupied a very strong position at Ferozeshah some ten miles both from Mudki and Ferozepur. Here the Sikhs had formed batteries and thrown up entrenchments shaped roughly like a horse-shoe. The toe, or central front, faced towards the south, and lay more or less parallel to the British line

of march. The right wing faced westwards, in the direction of Ferozepur; and the left eastwards, in the direction of Ludhiana.

The position was very skilfully selected as the ground in front of it was covered by low trees and bushes rendering any advance in line very difficult. It was defended by some ten thousand infantry, ten to twelve thousand cavalry and sixty guns. Thus the number of troops engaged on either side was approximately the same. The Sikhs were superior only in the number and size of their guns, which were extremely well served. The camp was in the village of Ferozeshah which stood in the centre of the position.

The two days following Mudki were spent by the British in collecting their wounded, in clearing up, getting the new reinforcements into their formations, and sending orders to General Littler at Ferozepur. At that time also the Governor-General, Sir Henry Hardinge made the dramatic offer to the Commander-in-Chief to serve as his second-in-command. Early on the morning of 21st December the army left Mudki in line of column and about ten in the morning arrived in front of the Sikh position. The force halted and made a haversack breakfast while the C-in-C made his battle plans, which were to attack the enemy from where he found himself, with the whole day before him. He rode up to the Governor-General and promised a sure victory. But the latter would not hear of any attack before Littler's force joined.

The force was then again set in motion in column and moved round the Sikhs towards Ferozepur. Early in the afternoon it reached the village of Shakur opposite the southern face of the Sikh horseshoe and there effected a junction with Littler. The whole army then formed line of battle in the time honoured form, with Littler's division on the left, Wallace's in the centre, Gilbert's on the right and Smith's in reserve. The C-in-C personally conducted the right wing while the left was entrusted to Sir Henry Hardinge.

The battle opened at four O'clock when the first gun was fired. The British artillery came into action all along the line and poured their fire on the Sikh position, the infantry being

ordered to lie down. The horse artillery commenced the battle, but were hopelessly outclassed, and twice had they to limber up and advance to get within effective range. They had to get closer or be blown up from the field. The heavy Sikh artillery were destroying their guns and blowing up their tumbrils. It was during this advance of the horse artillery that the incident of Snarleyow occurred, which Sergeant Bancroft has described as follows :

" . . . . . A ball struck the polehorse of the wagon, on which I was seated, in the stomach, and in an instant the poor horse's intestines were hanging about his legs. I called to the rider informing him of the mishap, saying 'Tom; Tom' Snarleyow (the name of the horse) has turned inside out, and his inwards are dangling about his legs". Tom shouted to the corporal leading the team 'Joe! Joe! pull up, Snarleyow's guts are hanging about his legs!' To which request the corporal coolly made answer; 'Begorra, Tom, I would not pull up at such a time, if your own guts were hanging out'.

Just about this time, an hour before sunset Littler's division advanced against the west face of the Sikh entrenchments. When he was 150 yards from the Sikh guns he gave the order to charge. The troops advanced boldly until within a few yards of the guns when the European Regiment on the right of the line, crushed by the overwhelming fire from the front, halted, turned about and fell back. A general panic spread throughout the division. The cry "India is lost" was heard from a battalion commander as he tried in vain to rally his men. The left attack on the Khalsa had failed so signally that it could not be renewed.

The main body now attacked, the right wing led by the C-in-C in person, the left by the Governor-General. We shall first follow the fortunes of the right composed of Taylor's and McLaran's Brigades. Taylor's men charged the Sikh position, taking the entrenchments, passed straight on beyond the guns to the Sikh infantry which protected the camp, where a gruesome fight was waged in the evening light. McLaran's brigade followed, and passing through a fearful fire of shot and shell, thinned in numbers, attacked the gunners. Here they were greeted by volley on volley from the Sikh infantry which stood behind the

devoted gunners. McLaran's men then wheeled to the left and dashed down the Sikh lines. At this time a serious accident took place. In the darkling light there arose, above the sound and fury of battle, the noise of a fearful explosion and hundreds of people were blown up. Right and left the light spread, making the darkness more terrible as another and another pile of ammunition was reached by the fire. But the brigade pushed on to the village where they joined the rest of the division. On the approach of darkness the division pulled out to take up a position 300 yards from the Sikh entrenchments.

Meanwhile Sir Henry Hardinge, with Wallace's division had experienced no less difficult a task. Amid the smoke and the dust, they mistook the precise locality of the Sikh guns, and they suffered heavily for their error, reaching a point where they were directly in front of the muzzles. For a time there was panic but the troops rallied, the Sikh guns were carried and they pushed on towards the Sikh camp. At this time by the explosion of some powder the tents and forage caught fire and the division was forced to retire to take up ground on the edge of the burning camp.

When the right and left divisions had launched the attack Smith's reserve division was ordered forward to fill the gap in the line. The division attacked, amid dense dust and heavy fire, and in immense confusion passed through the Sikh batteries and trenches picking up fragments of other corps, carried the village of Ferozeshah and reached the Sikh camp beyond in great disorder. Eventually this mob fell back on the village where they rallied. Here they were continuously attacked and escaped late at night to join Littler's division near Misriwala.

#### THE MIDNIGHT BIVOUC

Darkness was now rapidly increasing and with it the confusion. Men of all regiments and arms were mixed together. Generals knew not what was happening and colonels knew not what had become of the regiments they commanded or of the army of which they formed part. Some portions of the Sikh lines had been broken, while in other places they held fast. The British C-in-C wisely gave the order to Gilbert's division to draw off,

and all who could rally thereto, to a position 300 yards outside the Sikh entrenchments. All units were ordered to sound their assembly. Gradually those companies, battalions and remnants who were within hail collected on the position thus marked. The weary men lay down to rest with the Governor-General and the Commander-in-Chief in their midst. There was no food, there were no hospitals, there was no water. All over the field clumps of wounded and stragglers, formed often round the regimental surgeons, or stayed where night had overtaken them lest worse befall.

On that memorable night, when, it has been well said, "the fate of India trembled in the balance", the British were hardly masters of the ground on which they stood. Some brave men lost their nerve and urged a retreat upon Ferozepur. But the two old veteran leaders agreed that retreat was not to be considered for a moment. Yet so critical was the position that Sir Henry Hardinge sent away Napoleon's sword which the Duke of Wellington had given him after Waterloo., and despatched orders to his Secretary to destroy all state papers left at Mudki should the British army be cut to pieces on the morrow. Prince Waldemar of Prussia and his suite, who were with the army, were ordered off the field.

During the night a Sikh heavy gun, to which the Sikh gunners had crept, opened at close range. Sir Henry himself sent a party to take it. Early in the morning Sir Harry Smith and his division joined the troops in the bivouac.

Let us now take a look at the Sikh camp. The brave warriors who had defended it, led by generals who were betraying them, had, without knowing it, won a victory. They had repulsed the British attack. They had driven back Littler, forced Smith to retire, compelled even Gilbert to evacuate the position he had gained, and thrown the whole British army into disorder and confusion. What was more, they had still 10,000 men under Tej Singh, watching Ferozepur, who had not been engaged, and these could not fail to join them next morning. Had a guiding hand directed the movements of the Khalsa army nothing could have saved the exhausted British. But the Sikhs had no guiding hand. The honest men among them did not recognise the advan-



tage they had gained. To these divided counsels was added the fatal suggestion of a retreat made by traitors who desired nothing less than the victory of the Khalsa. The result was stormy counsels, bitter words and desertions. All cohesion vanished and morale disappeared. Early in the morning that arch-traitor Lal Singh deserted his comrades-in-arms whom he was supposed to lead.

But the Sikh rank and file unaware of the treachery of their generals continued to reinforce that part of their position which had not been attacked. The fire of their guns continued, as signals to that part of the army which had been worsted that their comrades still held their ground and required help. Everything announced that next morning there would be a desperate struggle.

#### THE TWENTY-SECOND DECEMBER

At length morning dawned, and daylight found the British army all ready to renew the struggle. After an artillery fire, under cover of which the front line advanced, a general onslaught was made on the entrenchments that had been reoccupied by the Sikhs during the night. Position after position was carried. Entrenchments, camps, and even the village, which had been the "Castle Dangerous" of the night before, fell to the British forces. Wheeling to the left, the line swept down the camp and cleared the last traces of the Sikhs. There were volleys of cheers and congratulations for victory.

But the rejoicings of the exhausted British army were interrupted by the news that Tej Singh's army was marching from Ferozepur and was close upon them. At that time even the confidence of that stout-hearted warrior the British C-in-C, wavered for a moment. As he wrote to his son later, "the only time I felt a doubt was towards the evening of the 22nd when the fresh army advanced, with heavy columns of cavalry, infantry and guns, when we had not a shot with our guns and our cavalry horses were thoroughly done up. For a moment then I felt a regret as each passing shot left me on horseback".

There was little time for thought. Tej Singh was soon upon them and once again the British were subjected to a fierce

cannonade. A vigorous attack was made on the left; it failed, and an equally vigorous demonstration forced the British to change front to right. A dreadful shower of shot and shell came over. Tej Singh was not at all serious. He was only skirmishing and feinting rather than leading his men to a resolute attack. So after making a show of force he fled, leaving his subordinates without orders and without an object, at a moment when the whole British force was at his mercy, when a portion was retiring upon Ferozepur, and when no exertions could have prevented the remainder from retreating likewise, if he had only boldly pressed forward.

Treachery on the part of Tej Singh was the true motive of his retreat. Had he been true and loyal the British army would have been annihilated and the Khalsa army would have stood victorious. The stream of history would have changed its course and who knows how much sooner the era of independence would have dawned.

The British had thus won a victory, but at the cost of a seventh of their numbers. They were paralysed after their prodigious exertions and the Sikhs were allowed to cross the Sutlej at their leisure to prepare for fresh contest.

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## THE PINDARI GLACIER

LIEUT. COLONEL M. R. RAJWADE, M.C.

THE Pindari glacier is one of the most picturesque and yet easily accessible glaciers of the Central Himalayas. It lies approximately 54 miles north-east of Bageshwar, the bus-head, which is 67 miles north of Ranikhet. I had originally planned to go with a small party of three officers during June but due to the early onset of the monsoon and some last minute changes, this visit had to be cancelled. Luckily I managed to get two months' leave during August and September and after managing to persuade a young officer at Delhi and hoping to pick up another volunteer from Ranikhet, it was decided that the three of us would be able, after all, to do this trek during the second half of September. From the climatic point of view too, we were told that September would be the ideal month.

### PREPARATION

The various stages of the trek from the bus-head to the glacier and back can be conveniently planned from a study of the location of Dak bungalows en route, the distances to be covered and the height to be climbed. If one is not fairly fit, as was the case with us, the hike takes approximately 10 days. If on the other hand one is in good shape, it should not take more than eight or even six days. We, however, decided on the following plan :

Day	Stage	Distance in miles	Height climbed	Height descended
D day	Bageshwar to Kapkot	14	550 ft.	—
D plus 1	Kapkot to Loharkhet	10	2000 ft.	—
D „ 2	Loharkhet to Dhakuri	6	3850 ft.	700 ft.
D „ 3	Dhakuri to Dwali	12	1350 ft.	1250 ft.
D „ 4	Dwali to Phurkia	3	1700 ft.	—
D „ 5	Phurkia-Glacier-Dwali	13	2500 ft.	4200 ft.
D „ 6	Dwali to Khati	7	—	1350 ft.
D „ 7	Khati to Loharkhet	11	1950 ft.	3850 ft.
D „ 8	Loharkhet to Kapkot	10	—	2000 ft.
D „ 9	Kapkot to Bageshwar	14	—	550 ft.

It can be seen from the above table that two conditions restricted the choice of alternatives. The first one being the stage Loharkhet-Dhakuri which entails a fairly steep climb of 3800 ft in less than 5 miles, had to be necessarily a fairly short one, and secondly the stage previous to the climb up to the glacier had also to be kept down, as one needs to be fresh for the last part of the trek above 11000 ft.

In order<sup>a</sup> to cut down weight and hence the expenses of additional porters from Bageshwar, I had decided to plan on a hard scale both as regards clothing/equipment and the rations. Clothing and accessories which could be easily tucked away in a valise were thus reduced in weight to approx 45-50 lbs and consisted of the following items :

Blankets Jungle OG	..	..	..	3
Razai	..	..	..	1
Durree	..	..	..	1
Pillows	..	..	..	2
Sheets	..	..	..	2
Trousers OG	..	..	..	2
Shirts warm	..	..	..	2
Jersey Pullover	..	..	..	1
Shirts white	..	..	..	2
Vests	..	..	..	2
Scarf	..	..	..	1
Cap comforter	..	..	..	1
Shorts	..	..	..	1 pr
Socks	..	..	..	4 prs
Boots	..	..	..	1 pr
Shoes	..	..	..	1 pr
PT Shoes	..	..	..	1 pr

Toilet requisites, towels, 5 tins of cigarettes and rum which were to be carried in the haversack weighed another 12 lbs approximately. In addition, water bottles and cameras were also to be carried individually.

The rations were based on a basic diet of two meals per day consisting of chapattis and dal for the ten-day round trip from Bageshwar. Fresh stores such as potatoes and onions were to be purchased at the bus-head and in addition to tea and tinned

milk at the scale of four mugs a day, the only other items of luxury were packets of biscuits, cheese and tinned fish. All the above rations less the fresh vegetables for two persons were packed in a light tin trunk which weighed about 35 lbs. Needless to say I had left these Q arrangements in the able hands of my wife prior to leaving Delhi.

On or about the 12 Sep i.e. a week before we were supposed to leave Delhi, Vipin informed me that he would have to back out, as the promised leave was not forthcoming. I knew the peculiar job he was doing here and hence was not at all surprised at this unexpected happening. However, hoping that at least young Jatar or Mukat would be able to join me in Ranikhet, I left Delhi on the evening of 21 Sep and reached Ranikhet the following day in the evening. There was yet another surprise in store for me! When I met Narbadash Sinha that evening at the Club, he told me that due to some unexpected station duties and forthcoming parades, he would be unable to let any of the youngsters go with me. I appreciated his difficulties for he had three officers away from the station then and with the limited numbers authorised for a Regimental Centre, he just could not allow any more officers to be away. There were two alternatives left for me—either to proceed alone or to abandon the trek. I chose the former course and asked Narbadash if he could at least allow a Jawan to accompany me. He very kindly agreed and detailed a newly promoted L/Nk, Rifleman Nar Singh, who hailed from Sama, to come with me.

#### THE TREK

These last minute developments delayed my departure by one day, but I was able to send off Nar Singh in advance to Bageshwar on the 23rd to make preliminary arrangements and engage two porters. I myself left Ranikhet at 1100 hrs on the 24th in a rickety old bus. The road for the first 53 miles to Garud is a first class tar macadam one but thereafter the last 14 miles are very dusty and in some places it is not even metalled. The country one passes through, for the most part, is dry and one gets a really good view of the snow range only from Kausani which is about 40 miles from Ranikhet. By and large this bus ride proved very monotonous and tiring and after in-

numerable halts I finally reached Bageshwar at about 1700 hrs. This little place is situated on either bank of the river Sarju and consists of neat masonry buildings with narrow, cobbled lanes and a fair sized bazaar. There are two dak bungalows, a post office and a civil dispensary, whilst electric power is also available from a nearby tiny hydel station. Nar Singh met me at the bus stand and we walked down to the District Board Dak bungalow which is situated near the suspension bridge. After a wash and a cup of tea I interviewed the two porters Mangal Ram and Govind who had already been engaged at the rate of Rs. 3/- per head per day. We sorted out the various loads and decided on what would be carried by the various members of the party and then I finally briefed them about the next day's move

It rained heavily that night but by early morning it had stopped and there was a fair amount of sunshine. The sky, however, was still overcast and there were low clouds in the valley. After the various loads had been packed, the porters started off at about 0700 hrs and we left half an hour later after paying Rs. 3/- for the night halt and a breakfast consisting of a cup of tea and one chapati each. This incidentally was to be our normal morning meal for the next ten days.

There is a regular jeep road from Bageshwar to Kapkot and it is being developed to take regular class 9 loads. For the first 5 miles this road keeps close to and north of the Sarju and then over a concrete bridge it continues on the south bank. Just before getting to this bridge the bridle path to the glacier takes off to the left and at this point we left the main jeep road. This path also keeps close to the river right up to Kapkot. The going is straightforward with occasional climbs and descents over hills covered with pine trees and ranging from 4000-5000 ft. A number of little streams join the main river at intervals and one comes across a few springs by the side of the path also. As the morning wore on, it began to get very hot and oppressive and we felt relieved when we reached Kapkot — at about 1330 hrs.

This little village has a few shops and the last civil dispensary in the region. The Dak bangalow is beautifully situated on the banks of the Sarju and is the cleanest along the whole route. Unfortunately we had to settle down in the verandah as

some high officials were supposed to arrive that evening from Mansiari and both the rooms had been reserved for them. During the afternoon we were lucky to have our clothes dried in the sun before it started to rain at about 1700 hrs and continued till after sunset. As a result of some changes in the plans of the Superintending Engineer, we were finally allowed to occupy one of the rooms for the night. For dinner that evening, we tried the local "hotel" and had no particular cause for complaint.

The morning of the 26th turned out to be dark and threatening and the sky was overcast with low clouds. However, we left at about 0700 hrs and after a mile, crossed over another suspension bridge and this brought us to the south bank of the river. The path rises only a few hundred feet during the next three miles and then one leaves the Sarju valley on a detour. After crossing the highest point, approximately 4500 ft, of a subsidiary range the track descends into the main valley and then across another bridge on the Sarju one reaches Saling Udiar. We stopped near a beautiful house in Udiar where we met the local Thakur who had, with great efforts, grown a lovely fruit orchard for himself. We were royally entertained to some tea without milk, oranges, wild figs and fresh green cardmon. After this welcome refreshment we continued towards Loharkhet. It had started drizzling then and after we had climbed for another half an hour it began to pour down. By the time we reached the Dak bungalow at about 1340 hrs we were soaking wet. Luckily the porters had reached just a few minutes before the rains started and our baggage was saved.

It was crisp and chilly as we started off for Dhakuri on the morning of the 27th. The hillside for the first mile or so up to the ridge is barren and then suddenly the whole scene changes. The eastern slopes of this range are covered with thick green jungle whilst the clouds as they hung low in the valley presented a beautiful scene. In Loharkhet we had heard some amusing and yet frightening tales about bears attacking lone travellers in these areas and as we climbed uphill, we wondered whether we too would have some interesting experience that morning!

The climb throughout the next 5 miles to the Dhakuri Khal is very steep as one ascends 3850 ft in this short distance. On

the way we met two beautiful young Kumaoni girls who were going back to Dhaunkuri after doing their weekly shopping at Loharkhet. I asked them whether they would permit me to take their photographs. They gladly consented and after having themselves filmed demanded one rupee from me ! They said that they had heard of film actresses and the fabulous salaries they get and therefore they considered one rupee quite a reasonable demand ! I agreed with them and handed them a clean rupee note.

We parted company at Dhaunkuri and continued our journey towards the pass. By then we were well over 8500 ft and as we climbed, it began to rain steadily. There was no point in halting as it did not appear as though it would clear, so we just carried on uphill. When we reached the highest point, 9600 ft, instead of being rewarded with a wonderful view of the snows, we were greeted with more rain and thick cloud all round. However, after a short halt for breath and a smoke we descended some 700 ft to the Dak bungalow in heavy rain. We were cold and miserable, more so as I had made the blunder of not carrying my pullover with me. However, after a scrub down and change of clothes we settled down to some hot tea and biscuits.

It rained continuously till 1700 hrs that evening and then almost with dramatic suddenness the clouds disappeared within a very short time unfolding a wonderful scene one had heard so much about. This Dak Bungalow at Dhakuri is situated in a wide clearing on the northern slopes of the Dhakuri Dhar which is covered with thick forests. It commands a superb view both of the Sunderdhunga valley which lies due north and the Pindar valley running in a north-easterly direction. Looking straight through the Sunderdhunga valley one sees Martoli — 22320 ft — towering above two other peaks of about 20000 ft. One can also see the characteristic flat table top peak of Nanda Kot through the Pindar valley. The golden rays of the setting sun, lighting up these gigantic peaks which appear so close from this place, leave an unforgettable impression of this magnificent panorama.

After spending a very cold night in spite of log fires, we started fairly late in the morning. There was lovely sunshine and the air was crisp and exhilarating as we descended into the Pindar valley. On the way down we first passed close to the few



huts and the brilliant red and mauve fields of "Choocha" near Saran, and then reached Khati at about 1100 hrs.

After a short halt during which Nar Singh managed to buy some potatoes we carried on towards Dwali. The Pindar valley narrows down to about 300 yards in this stretch and is flanked on either side by steep mountains ranging from 11,000 to 14,000 ft. high. The bridle path passes through fairly thick forest with plenty of undergrowth and at almost every bend one comes across either a lovely stream or a picturesque waterfall. On the way one has to cross two bridges—one four miles from Khati and the other below the Dak bungalow at Dwali. It had started drizzling by the time we came to the first bridge and thereafter it continued right till the time we reached the Dak bungalow which is situated at the confluence of the Kaphni and the Pindar rivers. We were pretty tired by the time we reached our destination and spent the rest of the day drying our clothes by the side of a log fire and generally relaxing.

In order to get the maximum rest prior to the last lap we had intentionally planned that the trek for the 29th should be a short one. We left Dwali at 0800 hrs in threatening weather and by the time we reached the Dak bungalow at Phurkia at about 1000 hrs it was raining pretty heavily. It had taken us approximately one hour and thirty minutes to climb 1,700 ft. in three miles and we had halted for more than 20 minutes at one stage to avoid a heavy downpour. This Dak bungalow is the second one built in Phurkia, since the first one which was situated about  $\frac{1}{2}$  mile higher than the present one, was destroyed in a heavy snow storm some 20 years ago. The present bungalow is situated in a bowl formed by an outcrop of huge boulders and one does not actually see it till one comes to within 10 yards of it. As with the other bungalows en route, it has two rooms but of smaller size and the roof is a steep sloping one designed to throw off the heavy snow one would expect at a height of 10,700 ft.

From the moment we reached the Dak bungalow it rained without a break till that evening. There was nothing to do except to keep indoors and escape from the rain and the biting cold wind which kept blowing the whole time. During the evening the Chowkidar came up to me and complained about severe

stomach-ache and dysentery. I learnt that this man had "discovered" a dead lamb some distance from the bungalow and thinking that it was clean enough "shikar" had organised a big feast in collaboration with a couple of labourers the day previous to our arrival. On further questioning, I was told that the lamb had been killed by a panther about ten days ago when the last of the flocks of sheep had departed from the grazing grounds near Martoli! I decided to try my hand at first aid and gave him eight pills of sulphaguanadene. Luckily for the chowkidar, this prescription worked wonders!

It cleared off for about an hour after sunset but began to pour down again from 2030 hrs onwards. I wondered whether we would be able to start early the following day and get a clear view of the glacier, since from what I had heard, the best time to make the trip was early morning. A postponement by a day would not have in any way guaranteed clear weather on the 1st of October and we had also come too near the glacier to think of abandoning the final lap. There was thus only one course left open to us and that was to start as early as possible the following morning and hope that, for at least a short spell, the weather might give us an opportunity to get a good view of the glacier. I briefed the porters to be ready at 0600 hrs in the morning to take the loads back to Dwali whilst Nar Singh and I were to proceed further. I did not want the chowkidar, who is also supposed to be a guide, to come with us but gave him the task of keeping hot tea ready for us on our return journey.

The night of the 29th was bitterly cold and wet. It was quite a job to keep oneself warm in spite of the "Thulmas"—heavy Tibetan blankets—which are provided by all the Dak bungalows north of Loharkhet. I could hardly get more than an hour's sleep that night, as apart from the cold, the rain beating down on the tin roof continuously, kept me awake and thinking as to what sort of weather we would have the next morning.

When we woke up at 0500 hrs and packed our loads, it was still raining heavily. It was just impossible for us to start then so we waited till 0800 hrs when it appeared that, after all, it might clear. The porters were the first to start on their way

down to Dwali and it was still drizzling when we set off for the final stage of our trek.

The climb for the first mile or so is very steep indeed and then the gradient suddenly eases off. The Pindar Valley at this point widens considerably and there is almost a complete absence of all trees except rhododendrons which too are fairly short in this region. Due to the unusual rains this year there were hardly any flowers and the bridle path too had become very slushy and had generally deteriorated in this stretch. There was fresh snow on the higher ranges on either side and every 100 yards or so one saw lovely waterfalls or streams. We climbed on steadily for another two miles and it was still drizzling although the intensity had dropped and the light had improved. On the way I had seen some rock pigeons and red beaked ravens and now in the distance I saw what looked like a herd of wild horses! I learnt later that a number of horse owners in Bageshwar and other places bring their herds here in June and just let them loose to graze for about four months. These horses are finally collected in the middle of October before the onset of the winter and taken down to the lower regions.

The valley now widened still more and on the opposite side of the river one could see huts at Martoli, which at this time of the year were abandoned as the shepherds with their flocks had moved down earlier due to the unexpected rains. After another mile we came across a natural cave formed in a huge isolated rock. This has been made into a cosy hut by stone walls which have been built by the shepherds who come here every year during the summer months. I learnt later that according to a legend, a certain Sadhu spent years in meditation in this cave even spending the winters here after blocking off the narrow entrance. From this point the old bridle path swings sharply to the left and leads one to the original snout of the glacier. We, however, continued further for another mile or so, first across a largish fast flowing stream and then turned right and came up to the last ridge which rises approximately 500-600 ft. This area on the map is shown as the camping/grazing grounds of Kupidhaura.

As we started on the last bit of our climb, the rain stopped completely and by the time we had reached the top of the ridge—

13,200 ft.—it had cleared off sufficiently for us to have a reasonable view both of the glacier and the peaks in the background. There it was, the complete grandstand view! In front of us some 700 ft. below was the thin muddy stream of Pindar emerging from the huge blocks of solidified snow of the glacier extending more or less level for the first 400-500 yards and then rising sharply in a series of gigantic steps. From the cracks formed in the ice one could almost perceptibly notice the forward movement of this mass of snow. Further back there were the towering peaks of Nanda Khat, 21,690 ft, on the left and Nanda Kot, 22,510 ft, on the right. One could not get a clear view of these peaks for any length of time as the clouds kept constantly hiding them from sight. However, I had ample time to take some excellent movies of this wonderful panorama. I next tried to recce a route down to the glacier, but as I had been previously warned that coming down this sheer moraine ridge would be very difficult, I was content merely to enjoy looking at the view from the top of the ridge for another half an hour. Nar Singh in the meantime had collected a haversack full of 'Goguldhoo'—a sweet smelling plant used in the manufacture of agarbatties. After a few biscuits and a smoke we decided to make our way back. Just then it started to rain, and we were thankful to Providence for giving us even that hour's clear weather just when we needed it most.

The time then was about 1100 hrs and we were keen to get back to Phurkia as soon as possible. On the way back, as we passed opposite Martoli, I spotted a couple of barals on the lower slopes of Bauljuri. It is normally quite difficult to shoot these animals and even if one is lucky, their recovery from the difficult slopes poses quite a problem. As far as we were concerned, as we had no rifles or guns, we had to content ourselves by merely admiring them. After a short halt to avoid a particularly heavy downpour, we reached Phurkia at about 1230 hrs. The chowkidar was ready with his hot tea and in the meantime the local Inspector of Schools had also arrived at the Dak bungalow. He very kindly gave us some biscuits and roasted 'lamb'. I was told that a panther had attacked some sheep near Dwali the night before and the Inspector's cook had bought from the shepherds, one "killed" lamb for only a rupee! I must confess

that to me the meat tasted perfectly normal and I had a large helping particularly as I had had no meat of any kind since we left Bageshwar on the 24th.

We reached Dwali by about 1530 hrs and spent the night there. The next two stages for the return journey had to be altered and we halted at Khati the following day and then moved straight back to Loharkhet on the third day. The most tiring day throughout the whole trek was when we walked from Khati to Loharkhet, particularly the descent from Dhakuri Khal was very strenuous. I met two very interesting people during our return trip. In Khati I met Bishan Singh a retired Havildar. This fine old man had served in the 39 Royal Garhwal Rifles in World War I and had fought in the same action and in the same Company in which L/Nk. Darwan Singh won his VC. The second one was schoolmaster at Loharkhet who together with a Bhotiya porter had crossed over the Traill's Pass during June this year without the aid of any special equipment or clothing!

After the last two stages from Loharkhet, we finally reached Bageshwar on the 4th. We thanked our two excellent porters and paid them off for the really good work they had done. The next day, again after that tedious bus ride we reached Ranikhet in the evening. I had lost seven pounds in weight and we were both pretty tired and dirty and hence the following day was spent in the much needed cleaning and maintenance.

This trek had originally been planned for a party of three. However, various reasons forced me to go alone. The weather too for the best part of the trip was somewhat unusual and wet. It cannot be denied that one feels quite lonely if the only company one has is that of a rifleman. In spite of all this, the trek was extremely enjoyable and had proved to be a very healthy way of spending a short holiday. Due to the convenient location of the Dak bungalows and the ease with which one could engage local porters, administrative arrangements too were very much simplified. Finally, I would suggest that all those young staff officers, who are unlucky to be posted at the Army HQ, should find some time during their holidays to do this or similar treks every year not only to get away from the boredom of office work but to keep themselves reasonably fit as is expected of them in their profession.

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REVIEWS**THE ARAB-ISRAELI WAR, 1948**

EDGAR O'BALLANCE

*Faber & Faber, 25/-*

Middle East politics are bedevilled by mutual Arab-Jewish antagonism. To put the Arab-Israel War of 1948 in its true perspective, the author of this volume has prefaced it with a short account of the early military history of the Arabs and Jews in Palestine in the opening chapters. It is a most useful account tracing the history of Palestine, for centuries regarded as sacred by three of the great religions of the world, from Biblical times down to the end of the British Mandate, on 14th May 1948. On the same day the *de facto* State of Israel had come into being, the USA being the first to recognise it.

As to the actual beginning of the Arab-Israel War, the author would take us back to 29th November 1947 when the General Assembly of the United Nations passed the resolution on the partitioning of Palestine, from which date Jews and Arabs began to fight each other seriously. He has divided the period of hostilities into distinct phases: the underground fighting which preceded the end of the British Mandate; the withdrawal of British forces and the attack on the new infant State by the regular forces of the Arab League; the first cease-fire which gave Israel much needed breathing space for consolidation; the subsequent successful Israeli 'Ten Day Offensive'; the second uneasy truce punctuated by incidents when the U.N. Mediator, Count Bernadotte was assassinated; and the final clearing operations against the Syrians in the North and the Egyptians in the South. In a short concluding chapter are contained a summary of the lessons learnt.

The narrative is factually and objectively written without any bias and is very readable. In the light of recent events in the Middle East it is also of topical interest for background material to one of the burning questions of the day.

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## THE SOVIET SECRET SERVICES

OTTO HEILBRUNN

*George Allen & Unwin, 18/-*

According to ordinary ethics a national of a country, whether a serviceman or a civilian, who aids the enemy in any way is a traitor to his country. The modern growth of psychological warfare has however introduced new usages. Enemy nationals may be induced to passive resistance or active collaboration which may even precede the actual outbreak of hostilities. Enemy soldiers may be prevailed upon to surrender while they are still able to hold out—one of the biggest crimes for a fighting soldier. International Law apparently has not kept pace with the modern 'refinements' of warfare. "Nothing in the International Conventions forbids a belligerent to use enemy nationals for any purpose for which they volunteer; only compulsion is prohibited".

The author attempts to show how conventional warfare is modified by the large-scale deployment of civilians in espionage, infiltration, subversion, sabotage and partisan warfare. He gives specific and documented instances of such activities in the last war, some of them as revealed during the war crimes trials. Both the Germans and the Russians had far-flung spy rings, but compared to the latter the author considers the former's methods pedestrian.

In future wars this prospect of the widespread activities of enemy sympathisers behind the lines will be greater than ever. In this war without a battle-field military thinking needs further readjustments.

It will be recalled that Otto Heilbrunn is co-author of 'Communist Guerilla Warfare' which has already been reviewed in these columns.

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## THE LEGACY OF THE LOKAMANYA

THEODORE L. SHAY

*Oxford University Press, Rs. 8/-*

The publication of this book was timed to coincide with the centenary celebrations in 1956 of the birth of one of India's greatest nationalist leaders. The author, an American student of the political philosophy of Bal Gangadhar Tilak, was enabled to continue his researches in India on a Knickerbocker Foundation fellowship. In this study he deals among other things with Indian Political Philosophy and Tilak's fight against Hindu orthodoxy no less than the British bureaucracy of his time. He has also attempted a comparative study of the Lokamanya with the Mahatma. There are useful biographical notes of the great nationalist leaders whose names occur in the volume.

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## A CONSTITUTION FOR PAKISTAN

HERBERT FELDMAN

*Oxford University Press, Rs. 5/-*

As the author states in his preface, this book "is a study of those facts and circumstances which have combined to create difficulty in the way of preparing a constitution for Pakistan". The first two chapters are headed "The Interim Constitution of Pakistan" and "Obstacles to Constitution Making". There are others which deal with changes in the administration, with the one-unit scheme, etc. The views expressed, it is stated, are entirely those of the author. A useful work of reference on the political and administrative changes in Pakistan since 1947.



CORRESPONDENCE**MOBILE DEFENCE**

CAPTAIN S. K. DANG, ARTILLERY

Lieut. Colonel V. P. Naib's article on mobile defence in the last issue of the USI Journal\* is very interesting and comprehensive in dealing with the various concepts of defence under present-day conditions.

However, in his views on "The problem of Anti-tank Defence" (pp 225-226) he develops the argument that the tank although the 'best means' of anti-tank defence, is not necessarily the 'correct means' in all cases. For instance in a country like ours with extremely limited resources he expresses the opinion that it would be unwise to fritter away our tank resources on anti-tank defence. Instead he suggests the use of assault guns, or Self Propelled anti-tank guns, and seems to prefer the latter.

I would like to submit to him, that the SP anti-tank gun in its present form, has all the problems of procurement or production as the tank, with none of its versatility. The only advantage the SP anti-tank gun may be said to have over the tank is its specially designed armament. However this is more than offset by the disadvantages of lack of protection for the crew, lack of mobility, and lack of small arms fire power, comparative to the tank.

In other words if it is difficult to obtain sufficient tanks for anti-tank defence, it would be equally difficult to obtain sufficient SP anti-tank guns. And even then the latter would not be as good an answer to the problem as tanks.

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\* July-September 1956

## SECRETARY'S NOTES

### Annual Council Meeting

At the annual meeting of the Council on 4th December 1956, Air-Vice Marshal A. M. Engineer, DFC, Deputy Chief of the Air Staff, was elected President of the new Council for 1956-57.

The Council decided to appoint Major Pyara Lal as Secretary and Editor in place of Lieut.-Commander K. V. Cherian, ex-Indian Navy, on the expiry of the latter's present term on 31st December 1956.

### Lecture

Sardar K. M. Panikkar gave a talk on "Peace-making and War-making in the Twentieth Century" on 29th October. The talk and the discussion are reproduced in this issue.

### Gold Medal Essay 1956

In the Gold Medal Essay Competition for 1956, the Council has awarded the Gold Medal and a cash price of Rs. 200 to Lieut. Colonel V. P. Naib, Artillery. The runner-up Major J. Nazareth, Grenadiers, has been awarded Rs. 200 cash prize.

It is hoped to publish the winning essay in the next issue of the Journal.

### Subject for 1957 Essay Competition

The subject for this competition is given elsewhere in this issue.

### New Members

From 1st October to 30th November 1956 the following members joined the Institution :

BAHL, 2|Lieut. V. B., Artillery.  
BHARGAVA, 2|Lieut. A. P., 18 Cavalry.

- BHARUCHA, 2|Lieut. H. H., The Kumaon Regiment.  
CHADHA, 2|Lieut. N. K., Artillery.  
\*CHAKRAVERTI, Lieut.-Commander T., I.N.  
CHENGAPA, 2|Lieut. S., The Sikh Regiment.  
CHENGAPPA, 2|Lieut. K. M., 8 Cavalry.  
DEWAN, 2|Lieut. S. P., Signals.  
DUGGAL, 2|Lieut. V. P., The Rajputana Rifles.  
DUTTA, 2|Lieut. V. K., The Guards.  
GHAI, Captain M. M. L., Engineers.  
GUPTA, 2|Lieut. G. K., Artillery.  
HANDA, 2|Lieut. H. N., 9 Gorkha Rifles.  
HARINDAR SINGH, 2|Lieut., E.M.E.  
IYENGER, 2|Lieut. B. S., E.M.E.  
JOSHI, 2|Lieut. Y. V., Engineers.  
KHANNA, Lieut. K. K., Signals.  
KHANNA, 2|Lieut. S. S., E.M.E.  
KUMAR, 2|Lieut. E. K., Engineers.  
MALHOTRA, Lieut. A. C., I.N.  
MALIK, 2|Lieut. S. C., Signals.  
MEHRA, 2|Lieut. K. K., E.M.E.  
MURTHY, 2|Lieut. N. Keshava, Engineers.  
NARASIMHAN, 2|Lieut. J. S., Signals.  
NARAYAN SINGH CHANDRA MALLA, 2|Lieut., Nepal Army.  
RAINA, 2|Lieut. G. K., The Sikh Regiment.  
RAJE, 2|Lieut. S. K., The Madras Regiment.  
RAMESH, 2|Lieut. C. B., Engineers.  
RAO, Instructor Captain K. S. R., I.N.  
RAO, 2|Lieut. E. V., E.M.E.  
SANDHU, 2|Lieut. S. S., Engineers.  
SAWHNEY, 2|Lieut. M. S., The Bihar Regiment.  
SHARMA, 2|Lieut. A. S., Engineers.  
SIRDESH PANDE, 2|Lieut. S. C., The Kumaon Regiment.  
SRIVASTAVA, 2|Lieut. N. L., Artillery.  
SIDHU, 2|Lieut. D. S., The Sikh Regiment.  
TAWADEY, Captain A. B., Signals.  
\*TEJA SINGH, Major, The Dogra Regiment.  
THAPA, 2|Lieut. H. B., Nepal Army.

UDHEY CHAND BHATARA, Major, Artillery.  
 VISHVANATH, 2|Lieut. B., Central India Horse.  
 \*VARMA, Lieut. R. P., 3 Gorkha Rifles.

# SUBSCRIBING MEMBERS

One Officers Mess was enrolled as subscribing member during the period.

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\*Life Member.

## CHANGE OF ADDRESS

To, \_\_\_\_\_ Date.....

Secretary,  
 United Service Institution of India,  
 Kashmir House, New Delhi.

Please note my new address.

Name (in block caps).....

Rank and unit.....

Permanent address.....

Present address.....

Signature.....

ESSAY COMPETITION**GOLD MEDAL PRIZE ESSAY COMPETITION, 1957**

The Council of the Institution has selected the following subject for the Gold Medal Essay Competition for 1957:

**"The three fighting Services and, indeed, the civil administration of countries have, in the past fifteen years, become increasingly inter-dependent in the conduct of war. There is much in the developments which we are likely to see in the next fifteen years to suggest not only that this inter-dependence will increase but that, in many cases, roles may become indistinguishable or, in some cases may even need to be interchanged. Is there a case, starting now, for a planned progression from three Services into one Defence Service?"**

Entries are invited from all Commissioned Officers of the Armed Forces of India, the United Kingdom and other Commonwealth countries, officers of the Territorial Army and the Senior Division of the National Cadet Corps and gazetted officers of the Civil Administration in India. They should be typewritten (double spacing), submitted in triplicate and be received by the Secretary, United Service Institution of India, Kashmir House, New Delhi, on or before 31st May 1957.

Entries will be strictly anonymous. Each essay must have a motto at the top instead of the author's name and must be accompanied by a sealed envelope with the motto outside and with the name and address of the competitor inside.

Essays may vary in length between 4,000 and 8,000 words. Should any authority be quoted in the essay, the title of the works referred to should be given.

Three judges chosen by the Council will adjudicate. They may recommend the Gold Medal to the winner and/or a cash prize, as well as a cash prize to the runner-up (subject to the sanctioned limit of Rs. 700 in all for prizes) and will submit their decision to the Council. The name of the successful candidate will be published in the October 1957 issue of the USI Journal.

Copyright of all essays submitted will be reserved by the Council of the United Service Institution of India.

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